27023

FT-17 / M1917 WWI Tanks

David Doyle

Walk Around®

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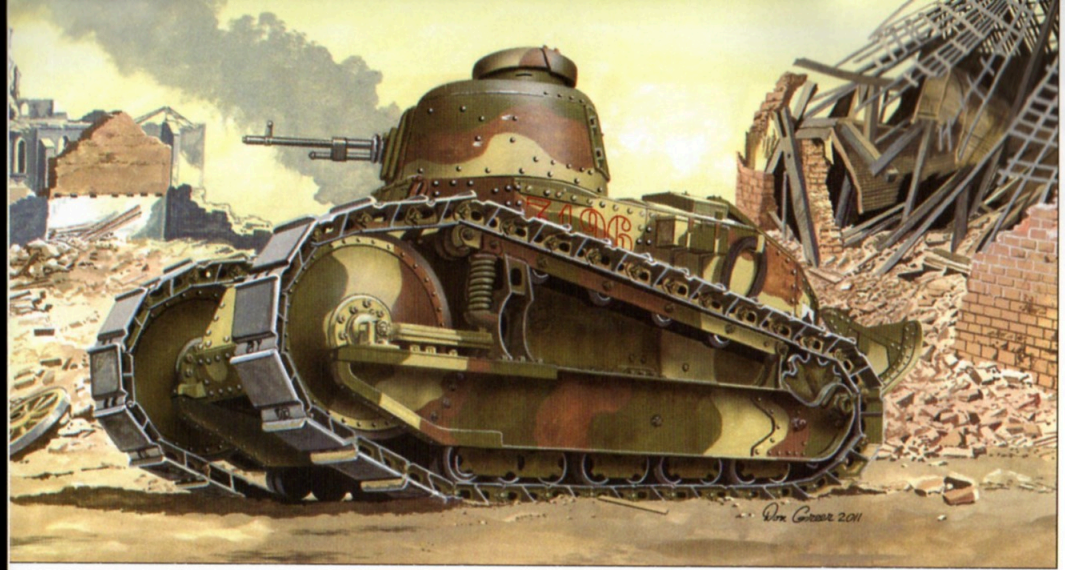
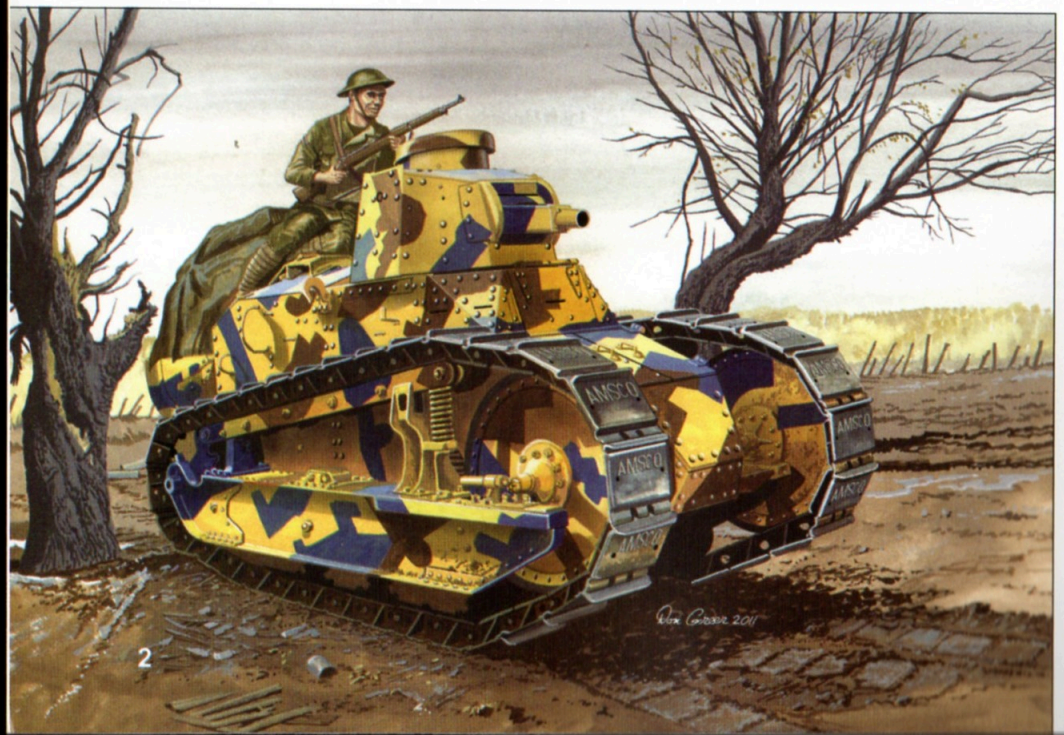


(Front Cover) The French Renault FT was the world's first "modern" tank. This FT-17, nicknamed "Le Tigre" and inscribed with the number 3196 in red outline, rolls through a war-torn town in France in late 1918. The tank is armed with a Hotchkiss 8mm machine gun and wears a pale green, olive green, and brown camouflage scheme.

(Back Cover) The United States produced near copies of the FT-17, dubbed M1917 "Special Tractors." A doughboy is hitching a ride on this M1917, armed with a .30-caliber machine gun in its riveted, octagonal turret. Wearing a yellow, blue, and brown camouflage scheme, the tank rides on treads embossed with their manufacturer's name, Amsco.



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(Title Page) One of the Saumur Renault FT-17 modifié 31s in running condition leads a group of French infantry re-enactors. The tank has an insignia of a black spade in a white circle and a mattock and a shovel are strapped to brackets on the side of the hull. The idlers have been renovated with metal panels replacing the original wooden parts.

Acknowledgments

This book would not have been possible without the generous assistance of many friends and organizations worldwide, including: David Fletcher, The Tank Museum; Tom Kailbourn; Scott Taylor; Virginia Museum of Military Vehicles; Don Moriarty; Joseph A. Horvath, Pennsylvania Military Museum, Pennsylvania Historical & Museum Commission; B.R. Howard and Associates; the U.S. Army Ordnance Museum; Neal Haydn; Massimo Foti; Dennis Trowbridge; Musée des Blindés de Saumur; Fort Meade Museum; Chris Hughes; and Pierre-Oliver Baun. In particular the help and support of my wife Denise and our sons Andrew and Brandon, made this work possible.

Introduction

The Renault FT-17 introduced the rotating turret to tank design. By itself, this innovation made this French light tank revolutionary, but coupled with the design's rear-engine, front-driver configuration, the FT-17 literally set the standard for tank styling for the next century.

The Automitrailleuse à chenilles Renault FT modèle 1917, as the tank was formally known, was born in the mind of Louis Renault, and brought to reality by designer Rodolphe Ernst-Metzmaier. Much of 1917 was spent perfecting the design, and actual output totaled only 84 tanks. This sluggish rate was soon overcome, and a total of 2,697 rolled out prior to the 11 November 1918 Armistice, thanks to Renault being joined by other producers: Berliet, Delaunay Belleville, and SOMUA (Société d'Outillage Mécanique et d'Usinage d'Artillerie). French Army deliveries are recorded as totalling 3,177 units, but it is possible that 514 of these were delivered directly to the U.S. Army, in addition to three to the Italian Army. Production continued after World War I, and some estimates put total output as high as 4,000 units.

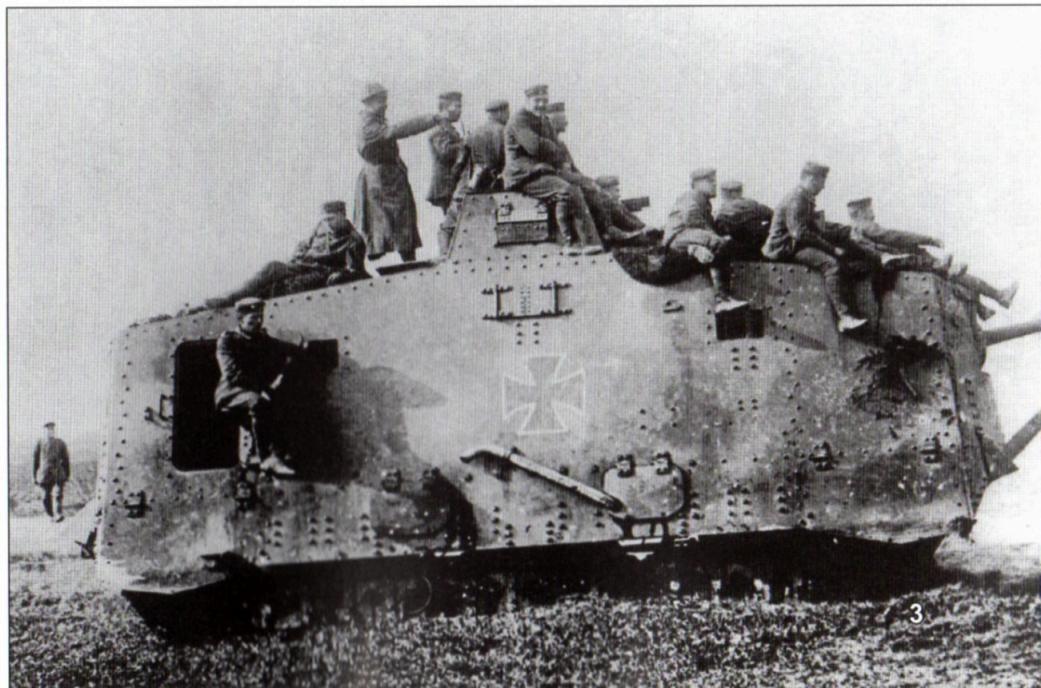
The round, cast-steel turret of the earliest FT-17s was soon superseded by an octagonal turret that, in turn, was replaced by the round "Berliet turret," fabricated from bent steel plate. While the cast turret only accommodated an 8mm Hotchkiss machine gun, the later designs could alternatively be fitted with a 37mm Puteaux cannon. Armed with a machine gun, the tank was designated Char Mitrailleur 8mm. Among the handful of other variants produced were command and artillery-support vehicles and a turretless signals vehicle with a superstructure, a single radio, and a crew of three (radio-operator, observer, and driver). A self-propelled gun variant, the Char Canon 75S, carried a 75mm gun in an open mount but was made in limited numbers and never saw combat.

Widely used by France, the U.S., and other nations during and after the war, the successful Renault design was licensed for production in the United States. The license-built tanks were modified to suit U.S. measurement systems, manufacturing techniques, and components, and were designated the M1917 Special Six Ton Tractor. Thirty-one of the M1917 tanks were completed during World War I and 10 were sent to Europe but arrived too late for combat. As with the FT-17, production of the M1917 went on after the Armistice. Van Dorn Iron Works of Cleveland, the M1917 contractor, produced a further 374 cannon-armed versions along with 526 machine gun-armed and 50 signal variants after the war. While a far cry from the wartime goal of 4,400 units (along with the 12,260 FT-17s projected by the French), this quantity seemed sufficient for the fledgling post-war Tank Corps. Between 1929 and 1931 seven of these tanks were modified. A lengthened hull accommodated a more powerful Franklin engine with an electric starter. These radio-equipped tanks were designated M1917A1 and were assigned to the Mechanized Force at Fort Eustis, Virginia.

The M1917 remained in U.S. service into the early 1930s, and 250 weary examples were sold to the Canadian Army in 1940 at scrap value (about $240 each) for training use. European armies employed the FT-17 into the early days of WWII, with the French Army alone using 1,600 of them. Many were captured by the Germans, redesignated as PzKpfw 18R 730(f), and used for internal security in occupied France. The last reported combat service of the FT-17 was its use by Egypt during the 1948 Arab-Israeli War. Once plentiful, today only a few of these revolutionary tanks remain – and most of them appear in this volume.

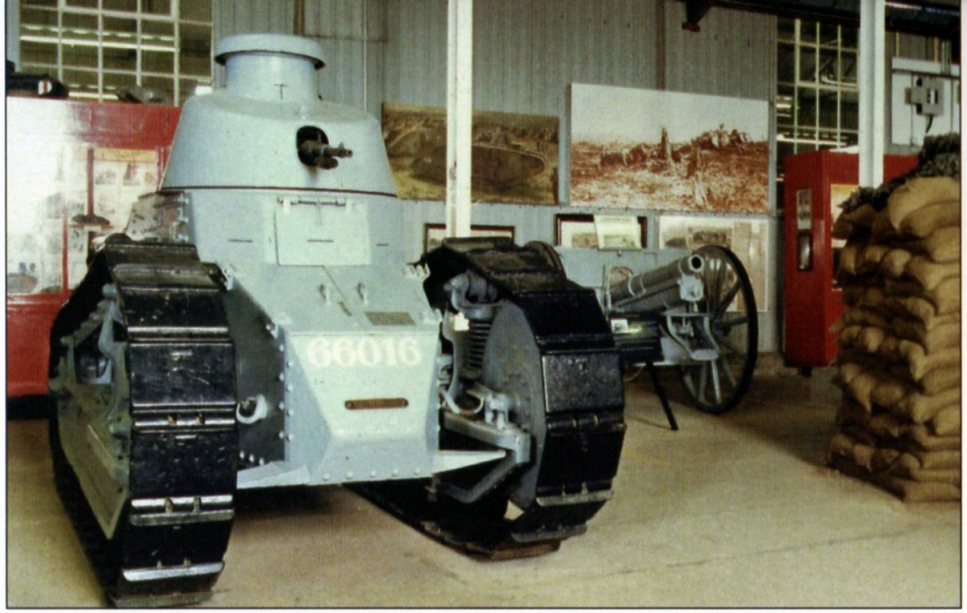
The typical British tank design of WWI includes a rhomboid hull with armament mounted in boxes protruding through the sides of the sponsons. The weapons had limited traverse and elevation, and could be either cannon or machine gun. This Mark IV is unarmed, and is being used as a transport. (The Tank Museum)

A boxy battlewagon bristling with six machine guns and a 57mm cannon, the German A7V tank made its battlefield debut in March 1918. The A7V was quite a contrast to the diminutive, lightly armed Renault FT-17 six-ton tank. (The Tank Museum)



Renault FT-17

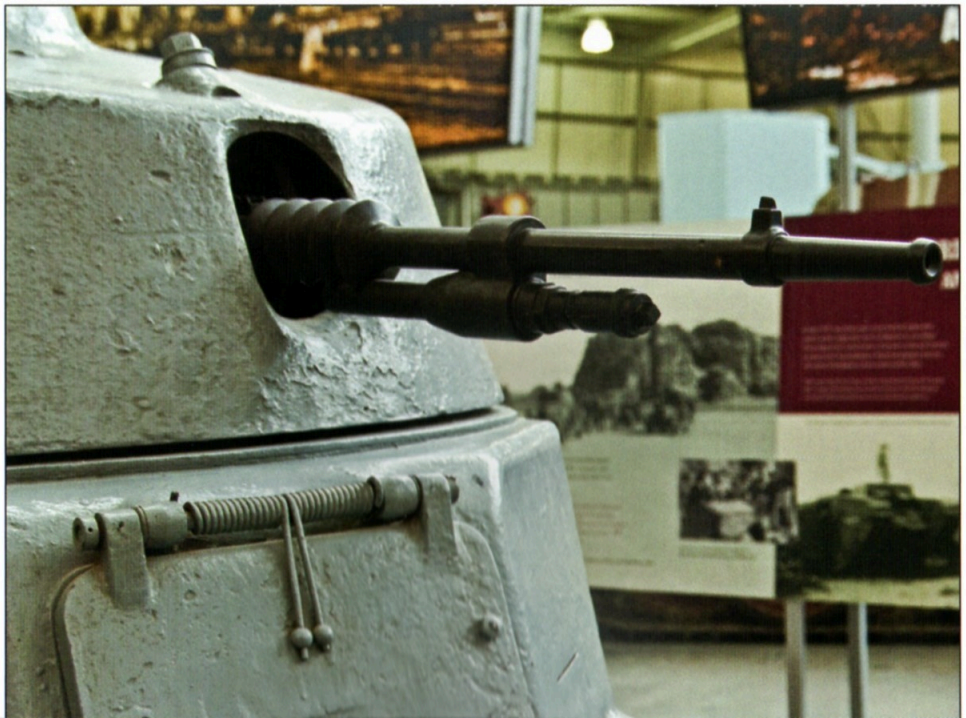
With its rotating turret, front-located driver's compartment, and rear-mounted engine, the Renault FT-17 (or, Automitrailleuse à chenilles Renault FT modèle 1917) was highly influential on subsequent tank designs. The Tank Museum at Bovington, England, is the home of this FT-17. It bears a small plate on the front of the hull that reads "non protégé," or "unarmored," as this vehicle was assembled from mild steel and was one of a run of 150 FT-17s intended as training vehicles. The hull has a one-piece nose. The commander's cupola atop the rounded turret is noticeably taller than on subsequent versions of the turret and includes a hinged ventilation cover. Armament was an 8mm Hotchkiss machine gun, which lacks a protective shield. This FT-17 is thought to have been consigned to the Imperial War Museum collection after World War I and was transferred to the Tank Museum in 1965. (The Tank Museum)



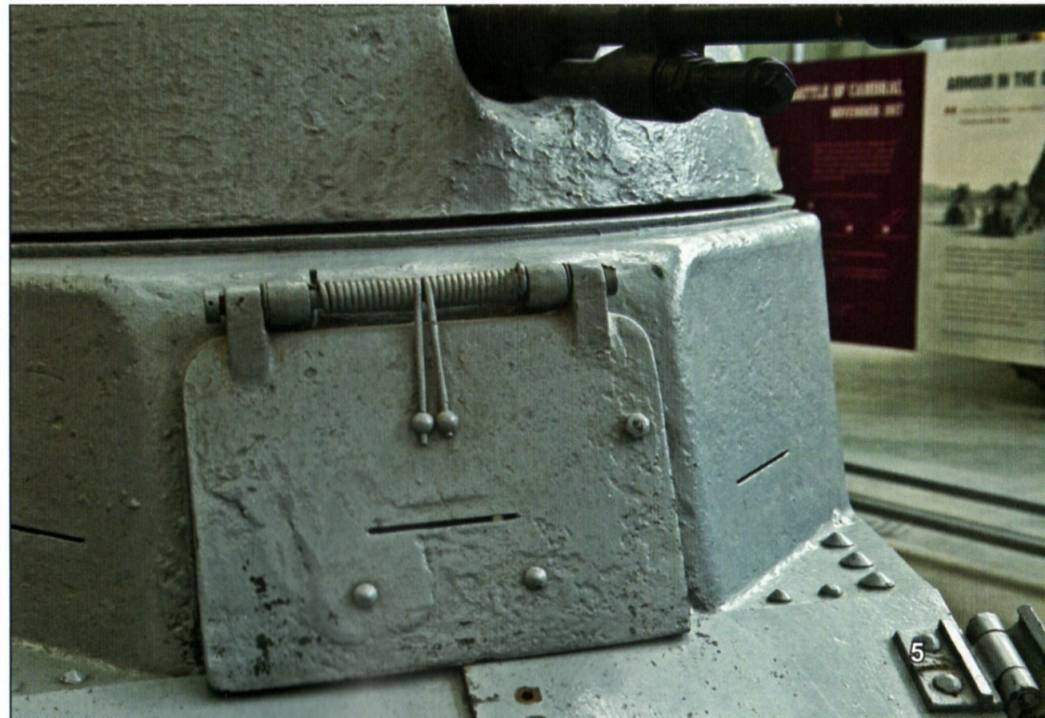
A front view of the Tank Museum's FT-17 reveals the one-piece nose of the hull and the two steps for the driver that protrude from each side of the front of the hull. Above and to the rear of the steps are tow hooks. Also visible are the coil suspension springs for the return roller beam. (The Tank Museum)

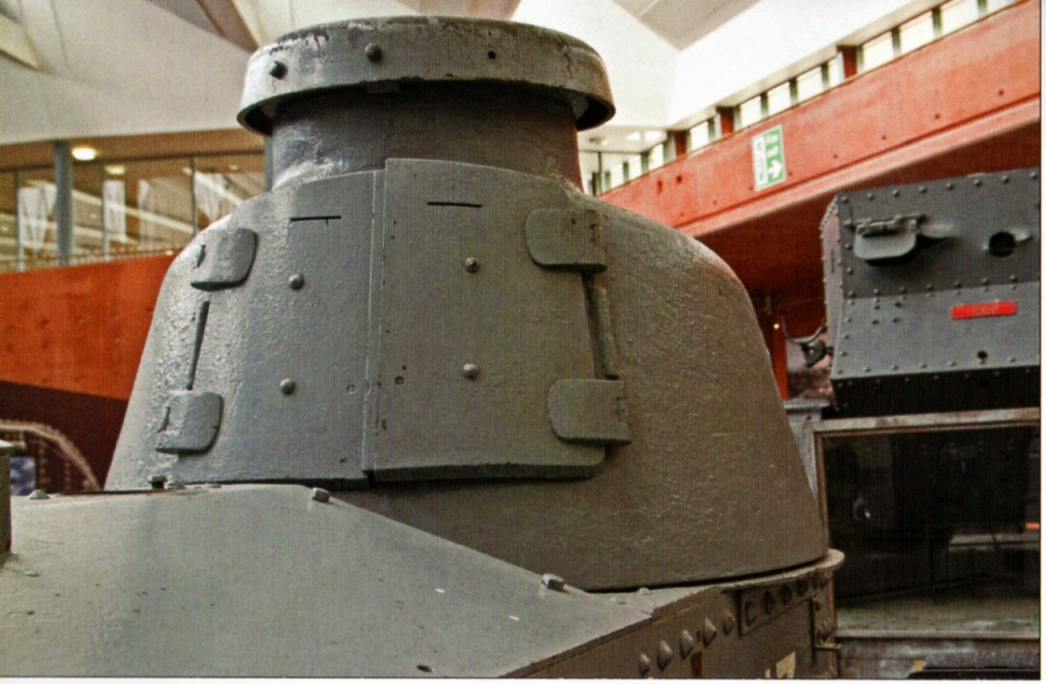
Shown here with the left-side suspension removed, the basic hull configuration of the Bovington FT-17 is clear. The same basic hull configuration was used whether the FT-17 featured a fabricated hull rear, or the cast one used on this vehicle. The large hole is the mounting point for the final drive assembly. (Massimo Foti)

Protruding through an exposed aperture in the turret of the Tank Museum's FT-17 is a Hotchkiss 8mm machine gun, along with the under-barrel gas-cylinder, which housed a regulator piston, controlling the rate of fire. (Massimo Foti)



Between the hinges of the upper door are springs that acted to keep the door closed. There are vision slits in the plates that flank both sides of the driver's upper door. (Massimo Foti)





Since the doors at the back of the turret do not extend down to the turret base, they can still be opened even when the turret is rotated such that the doors are over the engine compartment. (Massimo Foti)

Small vision slits in the cupola casting provide the commander with limited vision of the battlefield. The forward vision slit was T-shaped, with the ones on both sides being horizontal. (Massimo Foti)

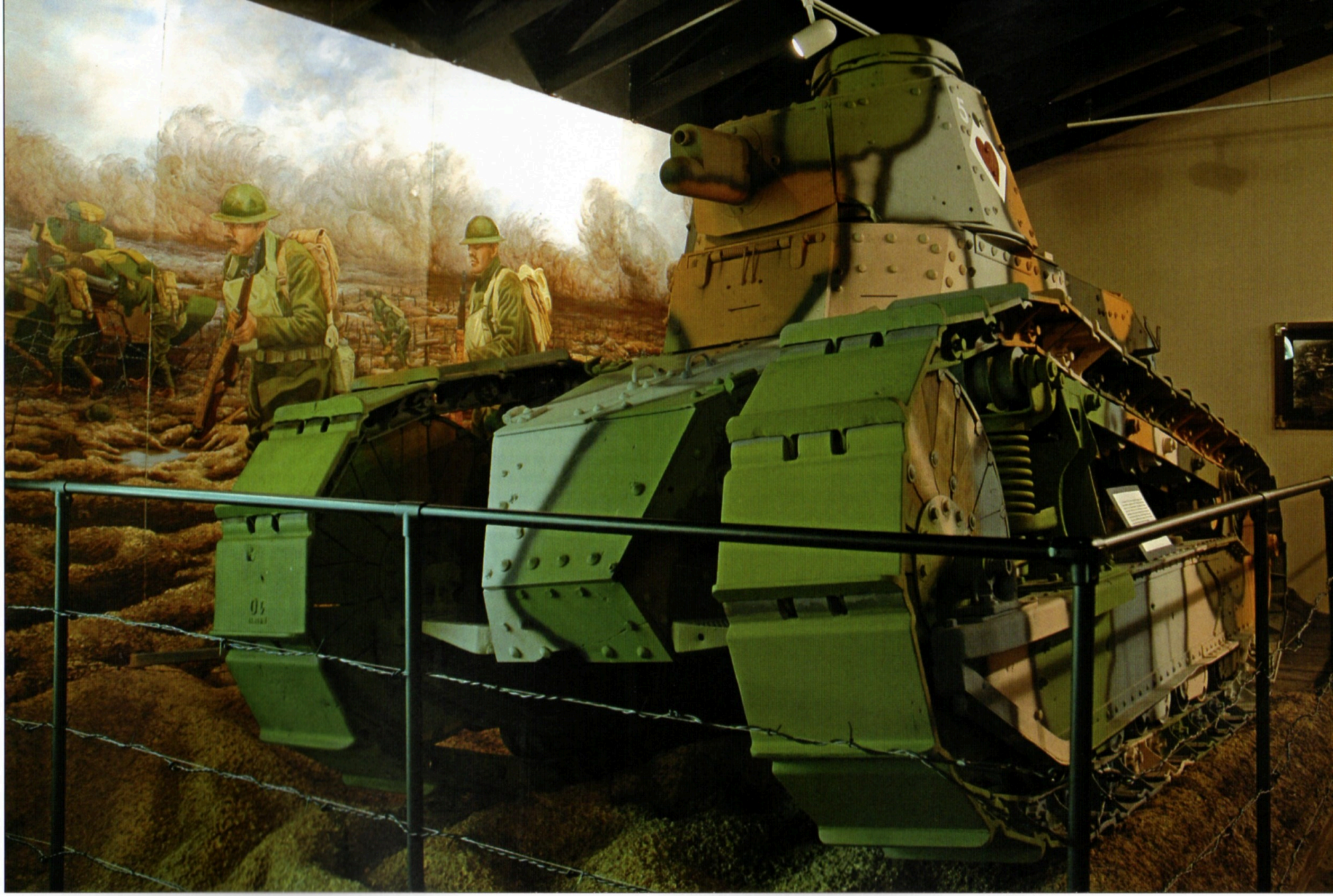
The weakness of the frontal armor protection, due to the lack of a mantlet, can plainly be seen here. (Massimo Foti)

The turret extends slightly beyond the sides of the hull, as is evident here. (Massimo Foti)

The 150 mild-steel FT-17s used for training had a rounded casting at the rear of the hull; production FT-17s had flat plates in this area. (Massimo Foti)

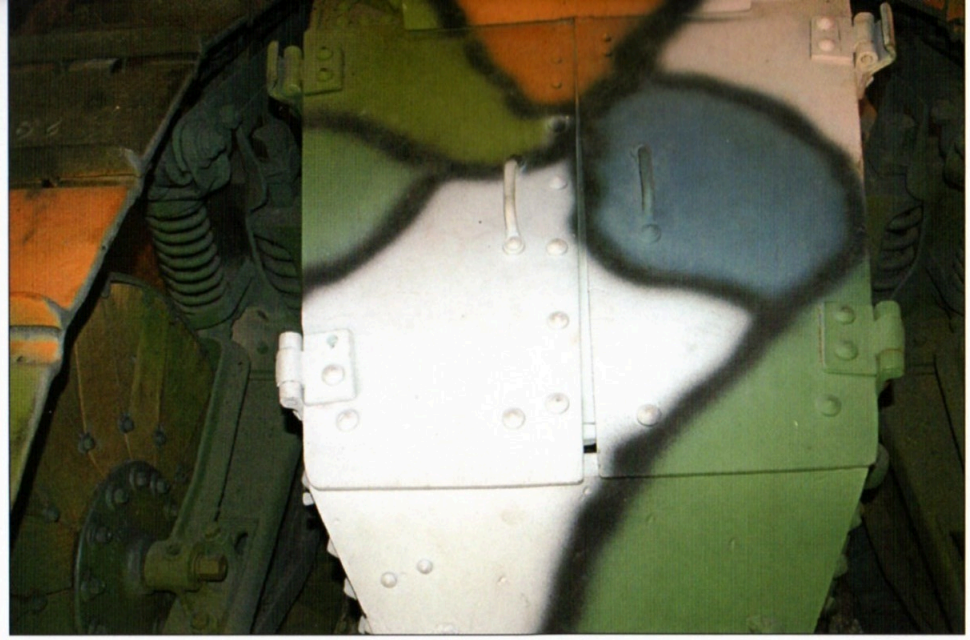
The vacant holes top and bottom on the side of the rear casting of this FT-17 are the mounting points for the tail piece, and are duplicated on the other side. (Massimo Foti)

The large idler at the front of the FT-17 suspension has steel rims and hubs but otherwise is fabricated from wooden parts. The idler is mounted on a horizontal yoke, at the rear end of which is an adjusting nut. Both sides of the front of the yoke are fitted into bearings that are bolted to the large beam that supports the bogie assemblies. (The Tank Museum)



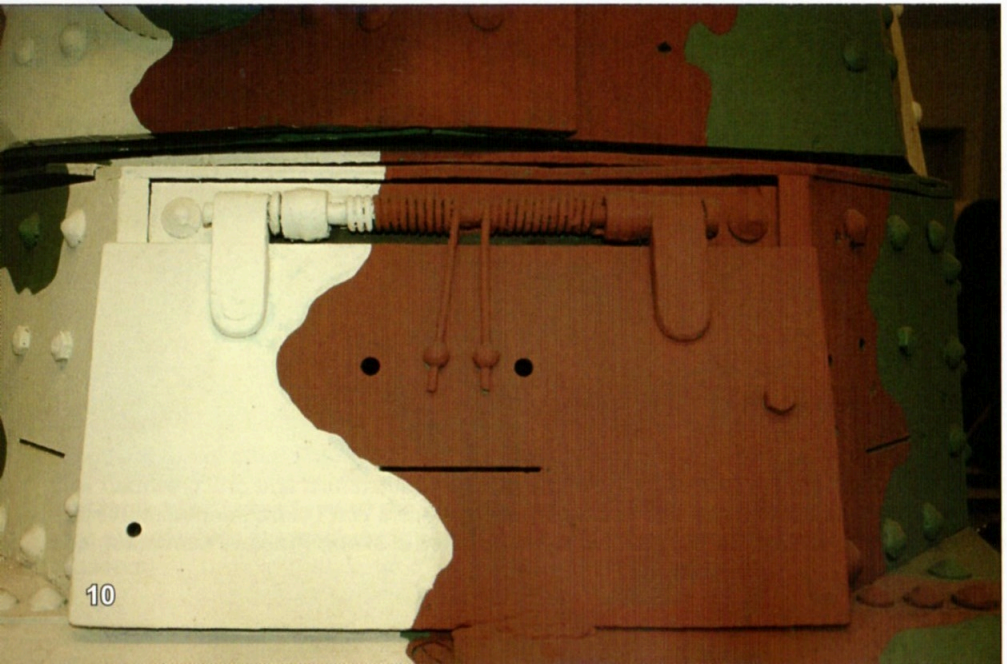
The French transferred this Renault FT-17 tank, dubbed the "Five of Hearts," to the U.S. Tank Corps in World War I, and it saw combat with the 344th Tank Battalion in the Battle of Saint-Mihiel and in the Fleville sector in the Meuse-Argonne Offensive in 1918. During the latter campaign, the tank was reportedly hit over 1,300 times, and one crewman was killed. After the war, when the battalion was stationed at Fort Meade, Maryland, the tank remained there as a memorial. It is painted in a post–World War I experimental multicolor camouflage scheme. The turret is the "Omnibus" pattern, fabricated from flat armor plates screwed to an internal frame. This tank mounted a 37mm Puteaux semiautomatic gun.

In this view from the front of the FT-17, the driver's upper door with the vision slit is at the top, below which are the two side-hinged lower doors. Curved door stops are on the rear hinges of the lower doors, and handles are bolted to the lower doors. Between the hinges of the upper door is the coil springs that held the door closed.



The row of conical-headed bolts on the inner edge of the driver's lower right door secures a strip on the inside of the door, forming a seal between that door and the left one. Also visible are the insides of the idlers and their yokes, and the four coil springs on which the beams for the bogies and the return rollers are suspended.

The driver's upper door of another FT-17 undergoing conservation is shown in close-up. On the FT-17, the two plates immediately to the rear of that door were approximately rectangular in shape, each one having a vision slit. Note the mixture of fasteners on the door and the plates, including conical-headed bolts and hex nuts.



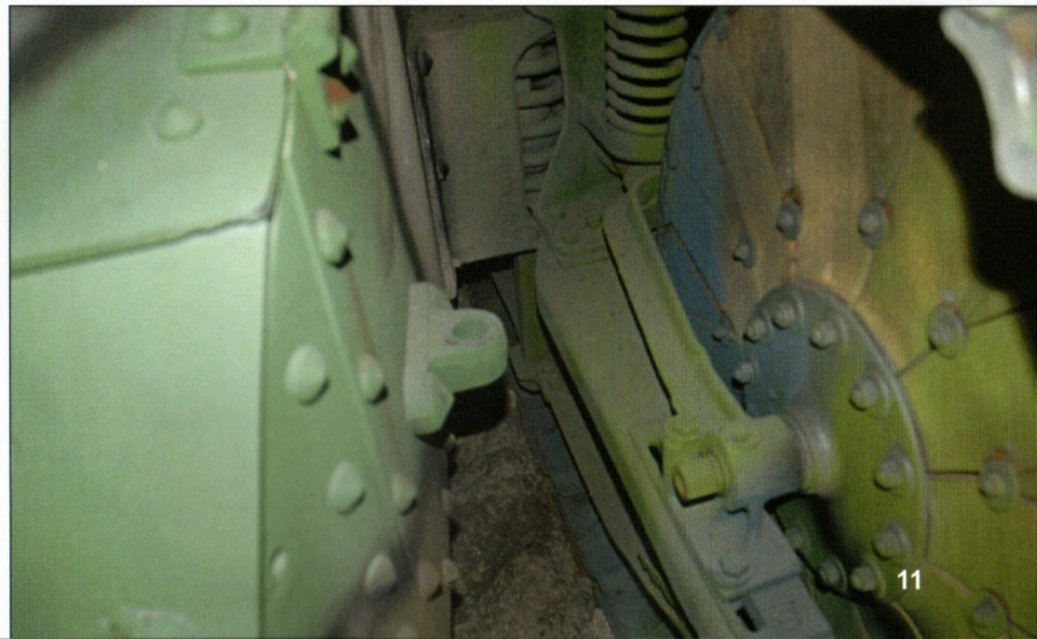
The tracks have been painted on this FT-17, but in wartime service they would have quickly worn to bare metal. A foundry mark, the number 10, is on the lower track shoe. At the lower right is a driver's step, while the front return roller is positioned above the upper coil spring. A small foundry mark is visible on the idler's hub.

The construction of the right idler is shown from the inner side. Numerous pieces of wood were fitted together to form the wheel. The U.S. M1917 tank would feature an all-steel idler. Each side of the front of the idler yoke incorporated a wheel bearing and a flange that was bolted to a serrated plate atop the bogie beam.

At the center of the photo is a bracket for the right front towing shackle (not installed). Four such brackets were installed on FT-17s, including two near the rear of the hull. On the U.S.-manufactured M1917, the tow eyes and brackets would be replaced with simple tow hooks. Note the tread pattern on the driver's step at the bottom of the photo.

In this view of the left running gear from the front of the tank, the front of the hull is to the left and the idler is to the right. Immediately to the rear of the idler are the front return roller and the coil spring for the return-roller beam. To the rear of that spring is the coil-spring bracket for the bogie beam, with casting marks visible on the bracket.

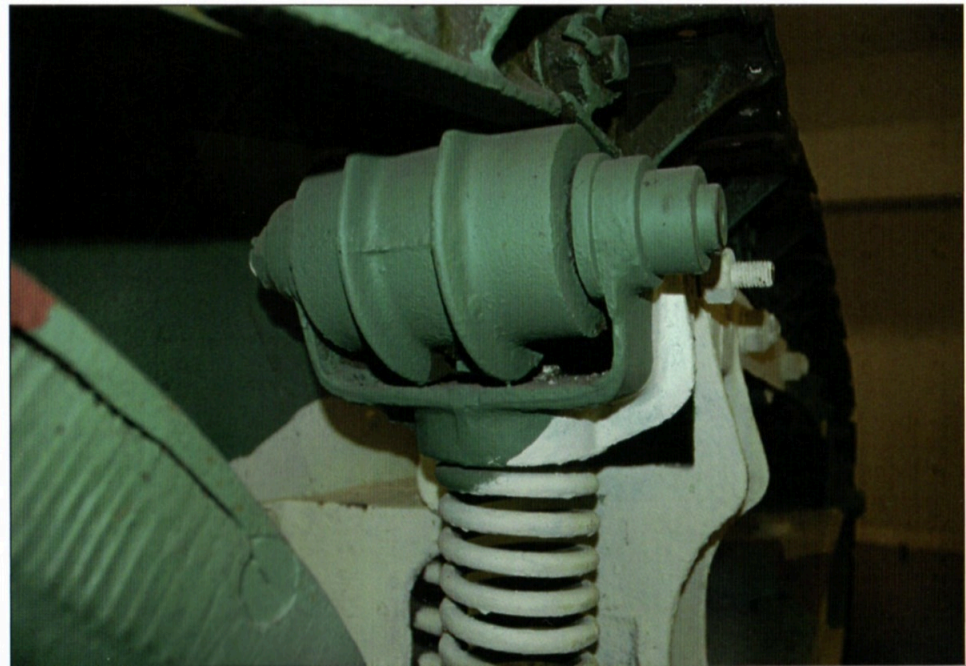
The serrated plate on top of the bogie beam on which the front of the idler yoke rests has a slot that allowed the front of the yoke to be secured with nuts and bolts once the idler had been adjusted using the large nut to the rear of the yoke. The serrated surfaces of the plate and the underside of the idler bearing flange made for a secure lock.



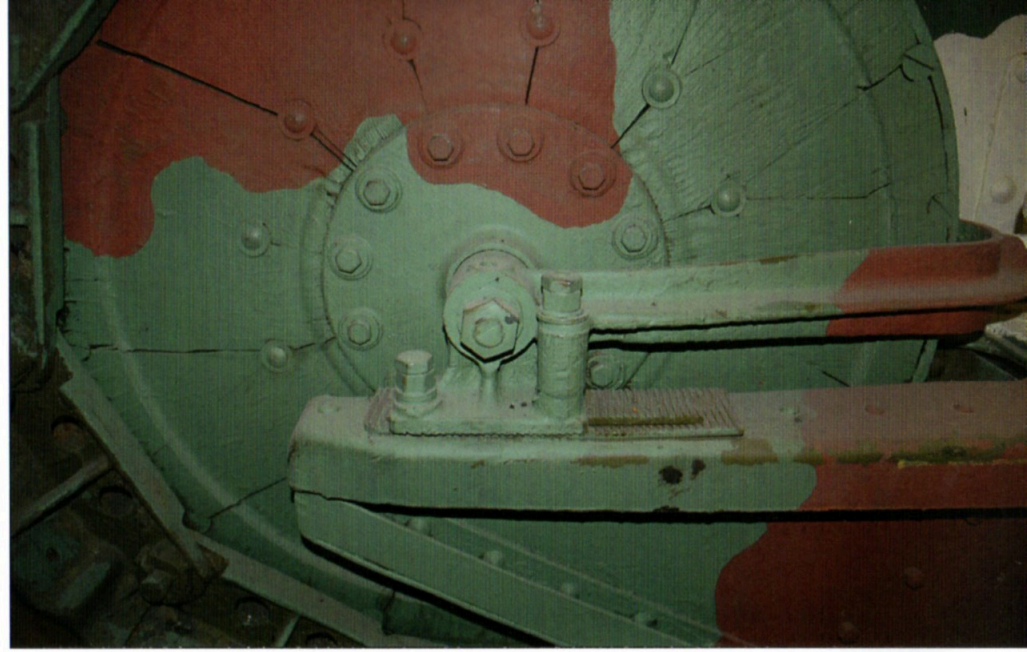
The spring brackets for the return-roller beam (right) and the bogie beam (center) are viewed from the left front of the FT-17. The bogie-beam spring bracket is secured to the side of the hull with conical-headed bolts. To the lower left is the front left towing shackle bracket. At the upper right are the front return roller and the inner side of the track.

A similar view is shown in close-up. There were six return rollers on each side of the tank, and they were mounted on spindles passing through the sides of the return roller beam. On the front side of the spring bracket for the bogie beam are casting marks: the letter R and an indistinct six-digit number.

As seen from the outer side and looking toward the rear of the tank, the front return roller has two raised ridges around the perimeter. The return rollers were 4 ¾" in diameter. The yoke for the front return roller also included on its bottom a cup that formed the upper bearing for the coil spring for the return-roller beam.

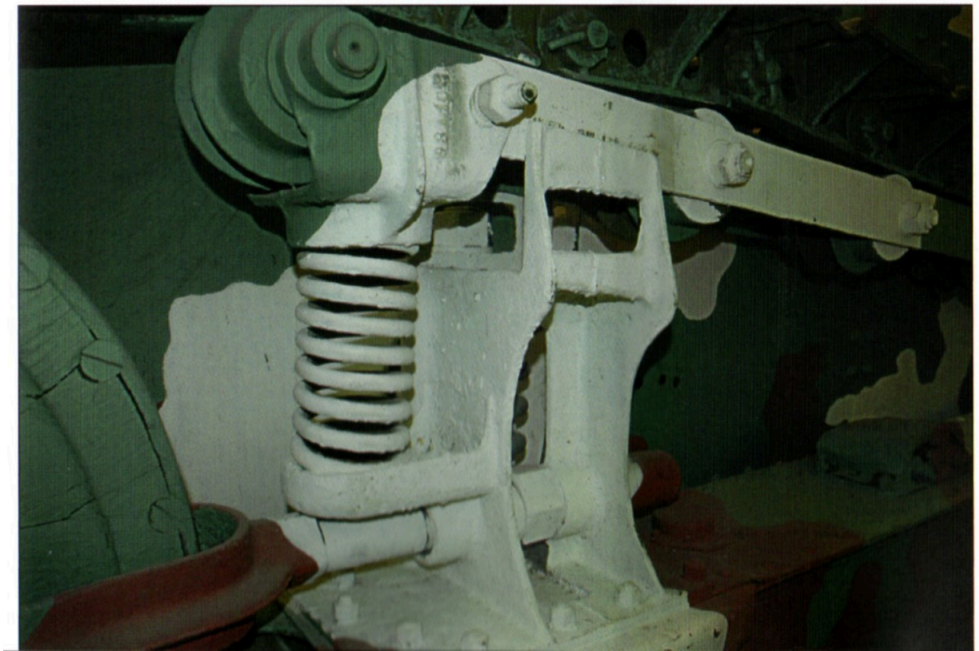


Casting marks on this track shoe are the letter B and a large number 32. There were 32 track links on each side of the FT-17. Each cast-steel track shoe was approximately 13" wide and had a pitch of approximately 10". Integral grousers (i.e., the raised ridge on one end of the track shoe) were cast into the outer faces of the track shoes.

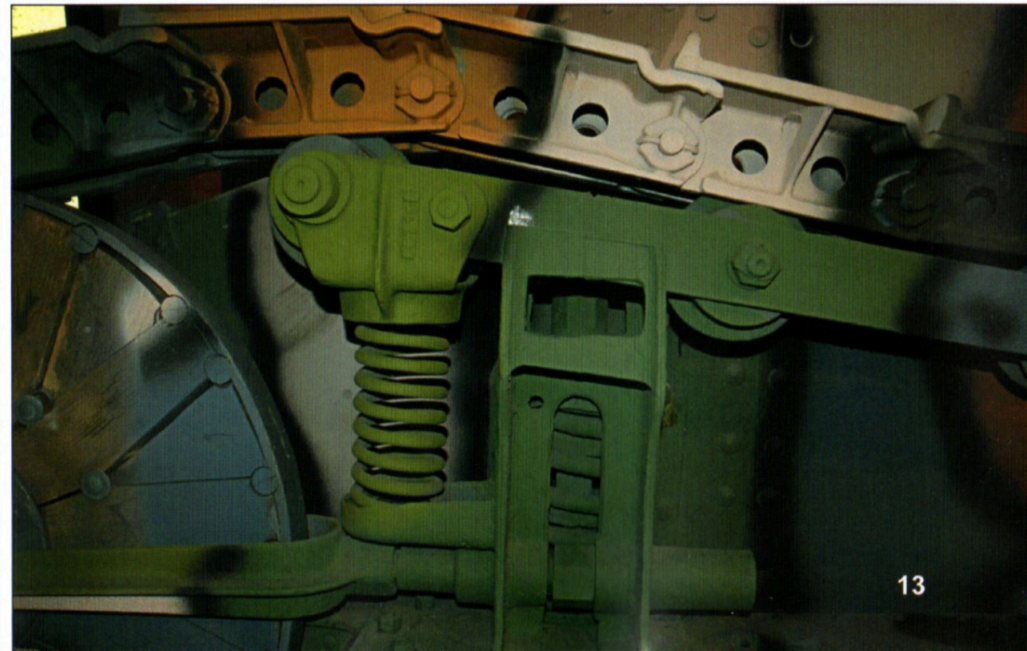


The intricate manner in which the idler of the FT-17 was pieced together with carefully cut and fitted pieces of wood is apparent in this view. The large, slotted screws around the perimeter of the idler helped hold the steel rim in place. The diameter of the idler was 33 7/8", and it was 2 3/16" wide at the outer steel rim.

Details of the return roller and its coil spring and bracket are visible. To the lower rear of that spring, within the uprights of the bracket bolted to the top of the bogie beam, a hex nut is visible toward the rear of the shaft of the idler yoke (lower center of photo). Turning this nut adjusted the idler to the front or the rear, to adjust track tension.



On the inner side of each track shoe were two girders with lightening holes. Each girder was 4 1/8" high, and the girders were spaced 3 15/16" apart. The track pins were secured with cotter pins. The idler-adjusting nut is visible in profile toward the bottom center of the photo, below the bogie-beam spring.

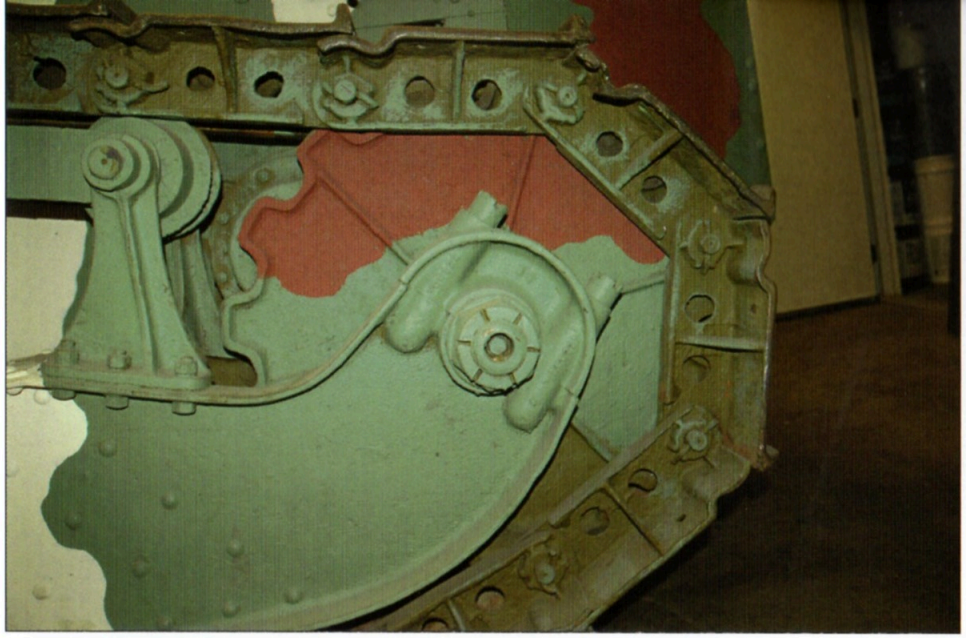


The bracket for the left return-roller spring is viewed from slightly to the rear. At the top of the bracket are guides that acted to keep the return-roller beam from flexing sideways outside of its normal limits. A casting number is faintly visible on the rear side of the spring bracket for the return-roller beam.

Looking down at the center portion of the left running gear, the housing bolted to the top of the bogie beam is a support for the leaf springs upon which the bogie assemblies were suspended. On each side of the tank there were two bogie assemblies, with five bogie wheels on the front unit and four on the rear unit.

The support for the left leaf springs of another FT-17 is shown close-up. The horizontal bolts through the support held the rear of the front leaf spring (left) and the front of the rear leaf spring (right). The bogie beam (bottom) hid most of the components of the bogie assemblies, leaving only the bottoms of the bogie wheels were visible.

The left rear of the running gear is illustrated. To the right are the drive sprocket and its bearing on the bogie beam. The raised bracket to the left of center supports the rear of the return-roller beam. The beam pivoted on that bracket, leaving the front end of the beam free to flex up and down, with its coil spring damping its action.



The left drive sprocket and its bearing are viewed from the side. The bearing is mounted on the upward-curving rear of the bogie beam and is secured in place by a C-shaped retainer that was bolted to the beam. The design of the girders of the track shoes is also in view; note the cotter pins that secure the track pins in place.

Seen in close-up from another angle on a different FT-17 are the left sprocket and its bearing. The lower edge of the C-shaped retainer is visible on either side of the sprocket bearing; the bolts that secure the retainer in place extend to the rear of the retainer. The drive sprocket has 15 large teeth and is 25½ inches in diameter.

General Data

	FT-17	M1917
Crew	2	2
Length (without tailpiece)	4.1 meters	166 inches (4.216 meters)
Length (with tailpiece)	5 meters	197 inches (5.004 meters)
Width (over tracks)	1.74m	70 inches (1.778 meters)
Height	2.14m	91 inches (2.3114 meters)
Ground clearance	40cm	16.2 inches (41cm)
Weight, combat loaded	6,500 - 6,700kg	14,500 pounds (6,577kg)
Max speed	7.8 kilometers per hour	5.5 miles per hour (8.851 kilometers per hour)
Range	65 kilometers	30 miles (48.28km)
Engine Make and Model	Renault	Buda HU
Cylinders	4	4
Displacement	4,536 cubic centimeters	312.1 cubic inches (5,114 cubic centimeters)
Gross Horsepower	39	42
Fuel, gasoline, capacity	96 liters	30 gallons (113.6 liters)

The "Five of Hearts" is viewed from the left rear. This FT-17 had the typical rear-hull design fabricated from flat plates, in contrast to the rounded casting found on the rear of the FT-17 on display at the Tank Museum at Bovington. The experimental postwar camouflage scheme is shown to good effect. There are at least six colors, with a black border between each one. On the side of the turret is the symbology for the vehicle's name: the number 5 next to a red heart within a white diamond. At the rear of the turret are the two closed doors that allowed the commander/gunner access to the turret.

The tail is secured to the rear of the hull with removable pins. Located on the flat plate at the rear of the hull is the fixture for manually starting the engine. To start the engine, it was necessary to remove the top pins of the tail and lower it before affixing the starting crank to the starter fixture.

This tail assembly has the cross-brace on top of the frame, a characteristic of French-built FT-17s. Toward the left on the rear deck of the tank, the vertical bolt mounted on a bracket, with a hex nut on top of the bolt, secured the center cover of the engine compartment in the closed position.

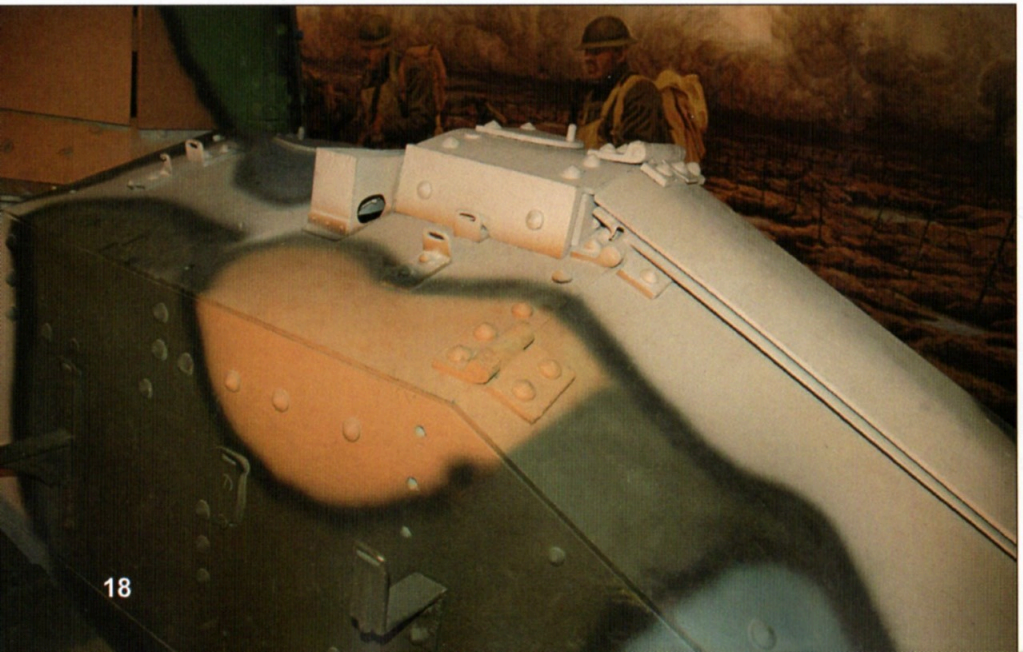
Some of the battle damage inflicted on the "Five of Hearts" is visible on the sheet metal skid of the tail. Just as the oversized idlers helped the FT-17 surmount obstacles to better effect than with small idlers, the tail assisted the small tank in negotiating trenches and other obstacles.

The locking bolt of the center cover of the engine compartment is shown in close-up. To release the bolt, the rounded nut was loosened and the bolt lowered. This was an eyebolt, with the eye pinned to the uprights of the bolt bracket. Note the various shapes and sizes of the bolt heads securing the armor to the frame.

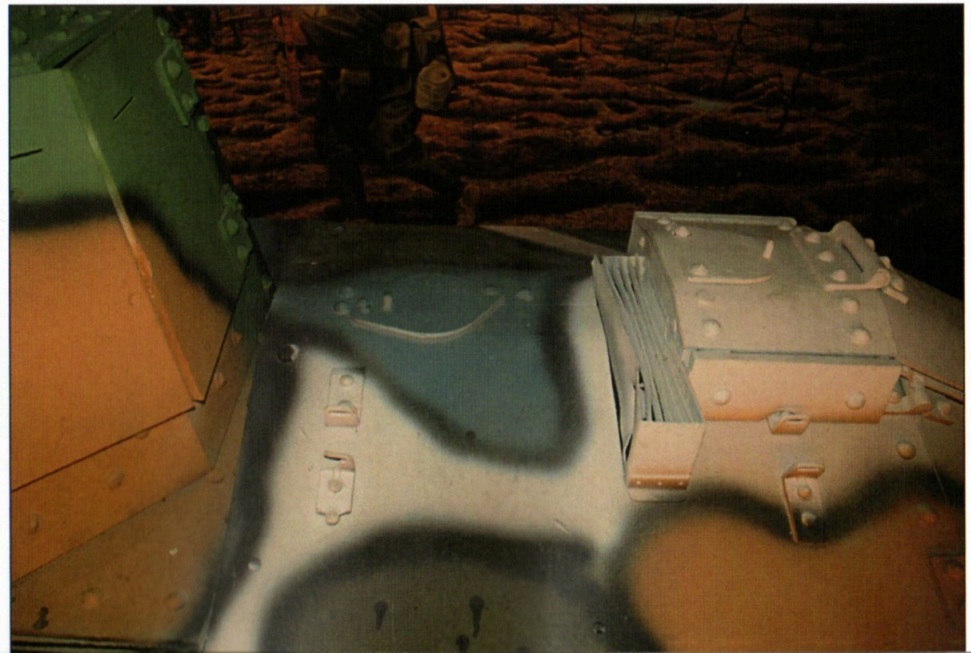
In a view of the left rear of the FT-17's hull, at the lower center is a bracket for a towing shackle, secured to the hull with conical-headed bolts. On the track shoe to the left, casting marks are visible, including a large number 3 with a small 4 next to it. There was variation in the casting marks on FT-17 track shoes, with some having no marks at all.

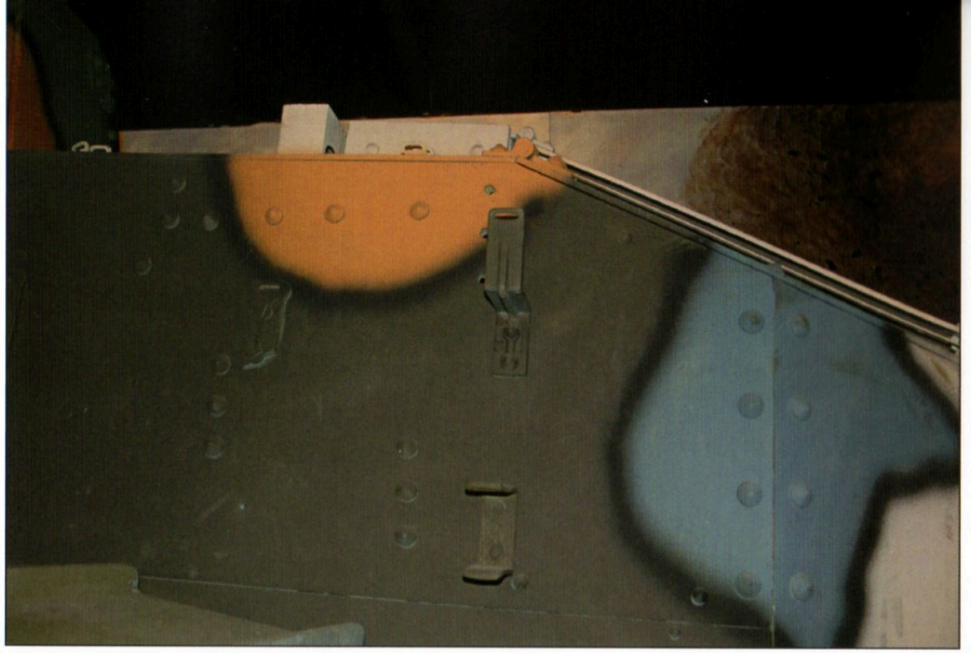
The left engine compartment cover, like the right-side door, has two hinges on its front side. The inner hinge is partially hidden by the center cover. The raised design of the center cover allowed ventilation air to pass under it and through the gap between the left and right engine compartment covers.

The rear deck is viewed from the left side. To the right of center is the hinge on the front edge of the center door of the engine compartment, with the front of the hinge attached to an armored box. The box was designed to protect the radiator filler; on top of the box is a pivoting cover providing access to the filler.



The handle on the radiator filler cover consists of a small metal rod. To the front of the armored enclosure for the radiator filler is the air intake for the radiator, constructed of fairly thin metal with a louvered top. The oblong plate toward the center of the photo is the access cover for the fuel filler.



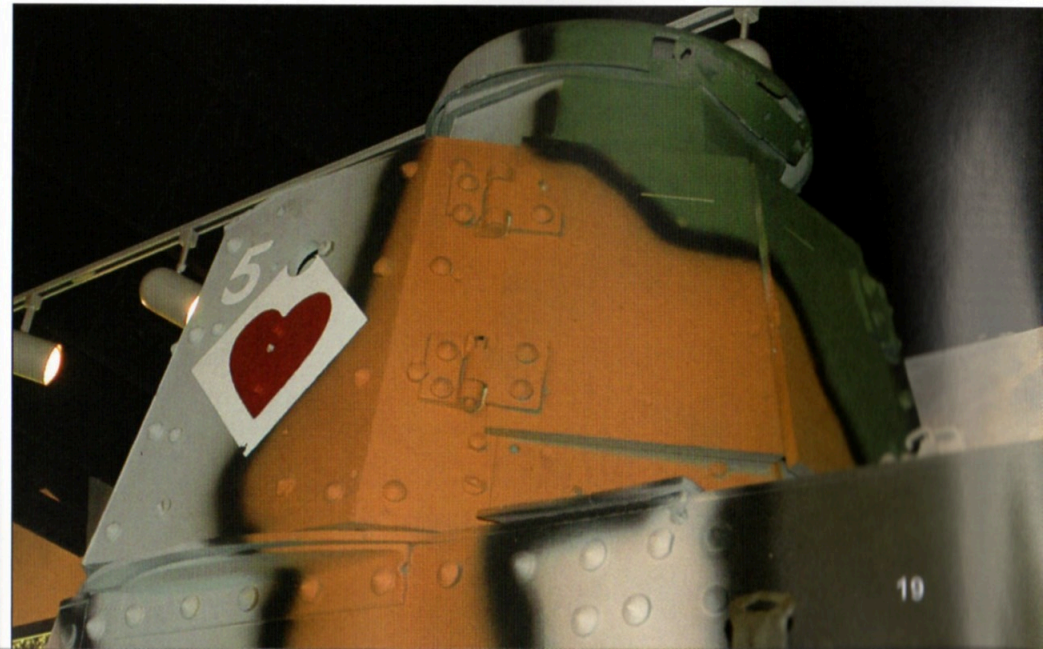


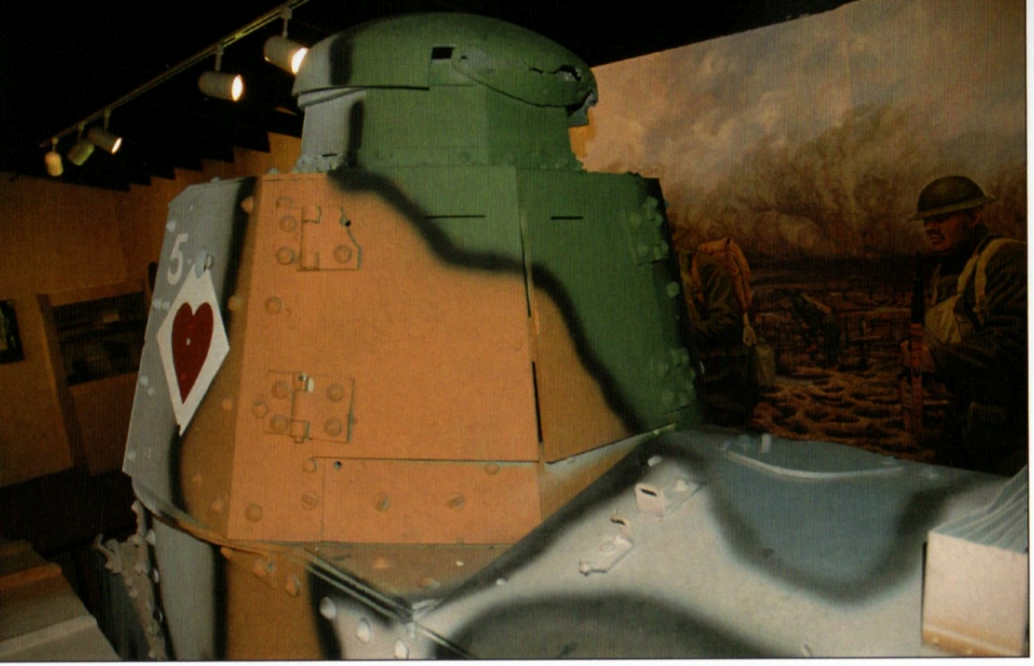
Several brackets for stowing tools and implements are on the left rear side of the "Five of Hearts." The top one has a slot on top for a strap. These brackets held a coiled tow cable. Above the rear deck to the right, the edge of the center door of the engine compartment is visible.

On the rear left side of another FT-17, the two brackets to the right (the lower one is broken) held a coiled tow cable, while the two large brackets to the left held a tool box. Cast onto the side of each tool box bracket are the part number, 300733. At the top of each arm of these brackets is a slot for a retainer strap.

The brackets are viewed toward the rear of the FT-17. The left and the lower right brackets are broken. Below the tool box brackets is a horizontal line demarking the seam between an upper side plate and lower side plate, and to the right, the vertical joint between the upper plate and the oblique rear plate is visible.

The access doors to the turret are face-mounted, and the hinges are offset to allow for this. Bolted to the top of the hull below the side of the turret on each side of the vehicle is an angle iron with a rounded top to match the hull roof. This angle iron was necessary because of the absence of internal framing in that area on the inside of the hull.

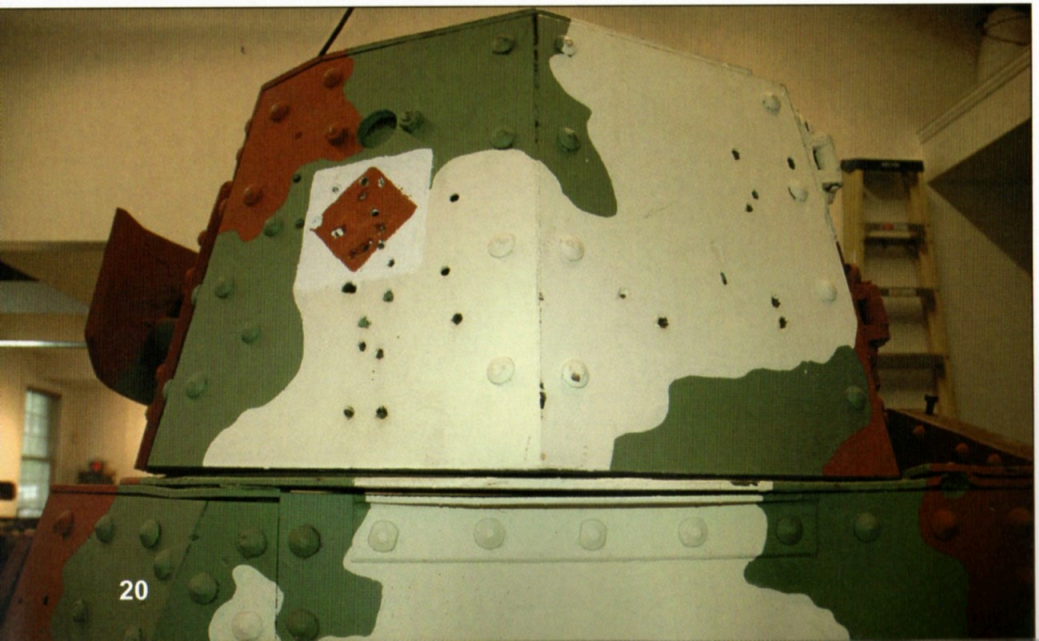




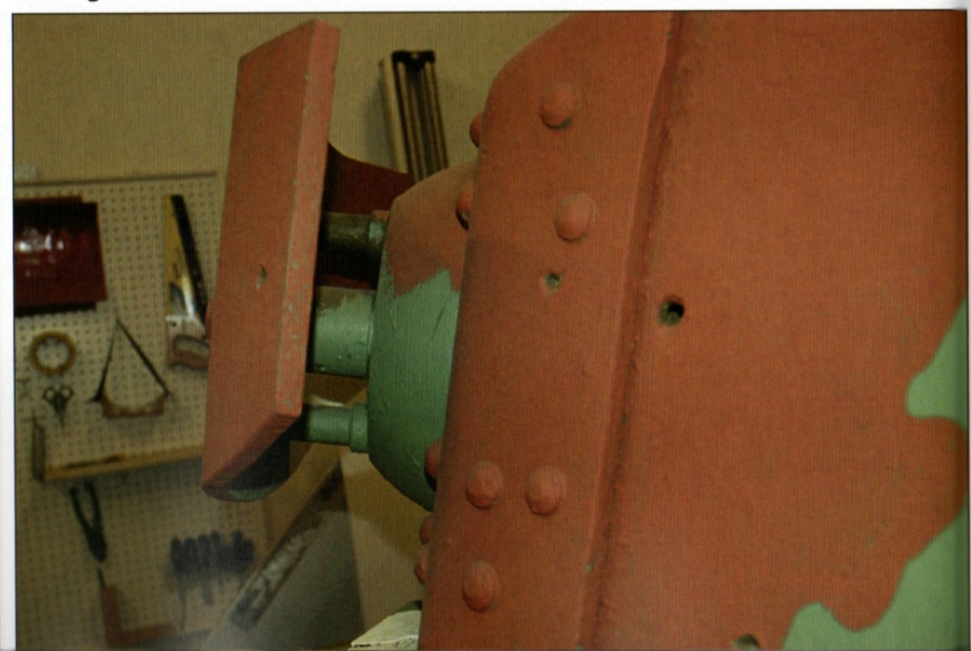
The cover of the cupola has suffered some damage to its rear. A vision slit is located on each of the turret doors. To the top of the heart insignia is an open pistol port. There was another pistol port at the corresponding spot on the other side of the turret. In addition to conical-headed bolts, hex bolts and slotted screws are present on the turret.

The turret of "Five of Hearts" is viewed from the front. The gun shield is evidently a postwar modification, as a photo of this tank during World War I shows no shield in place. The 37mm gun appears to be a facsimile. The octagonal cupola was fastened to the turret roof with angle irons. The cupola had four vision slits.

The turret of this FT-17 undergoing conservation still bears the bullet holes inflicted on it during combat. The view is from the left side of the tank. The bolts flanking the pistol port above the insignia secured the cover of the port in place. One can gauge the thinness of the turret armor with one look at the pistol port.



The gun shield and front of the turret are viewed from the left side. The two thin horizontal cylinders projecting from the gun mount hold the shield in place, while the larger cylinder between the smaller ones is the extension tube for the gun sight. The 37mm gun was not installed in this turret when it was photographed.

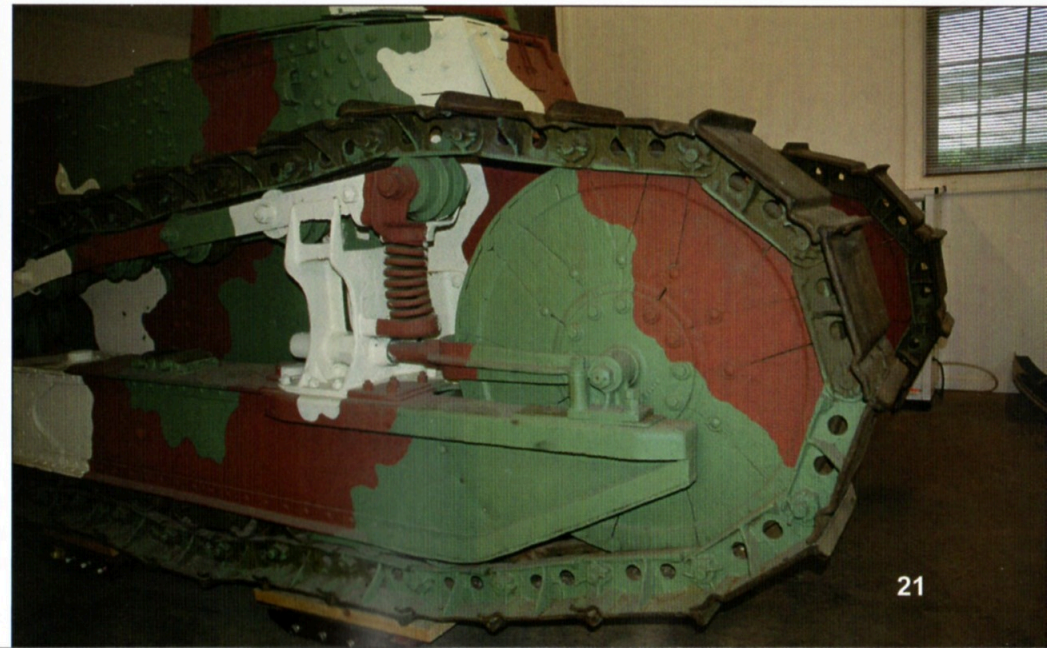


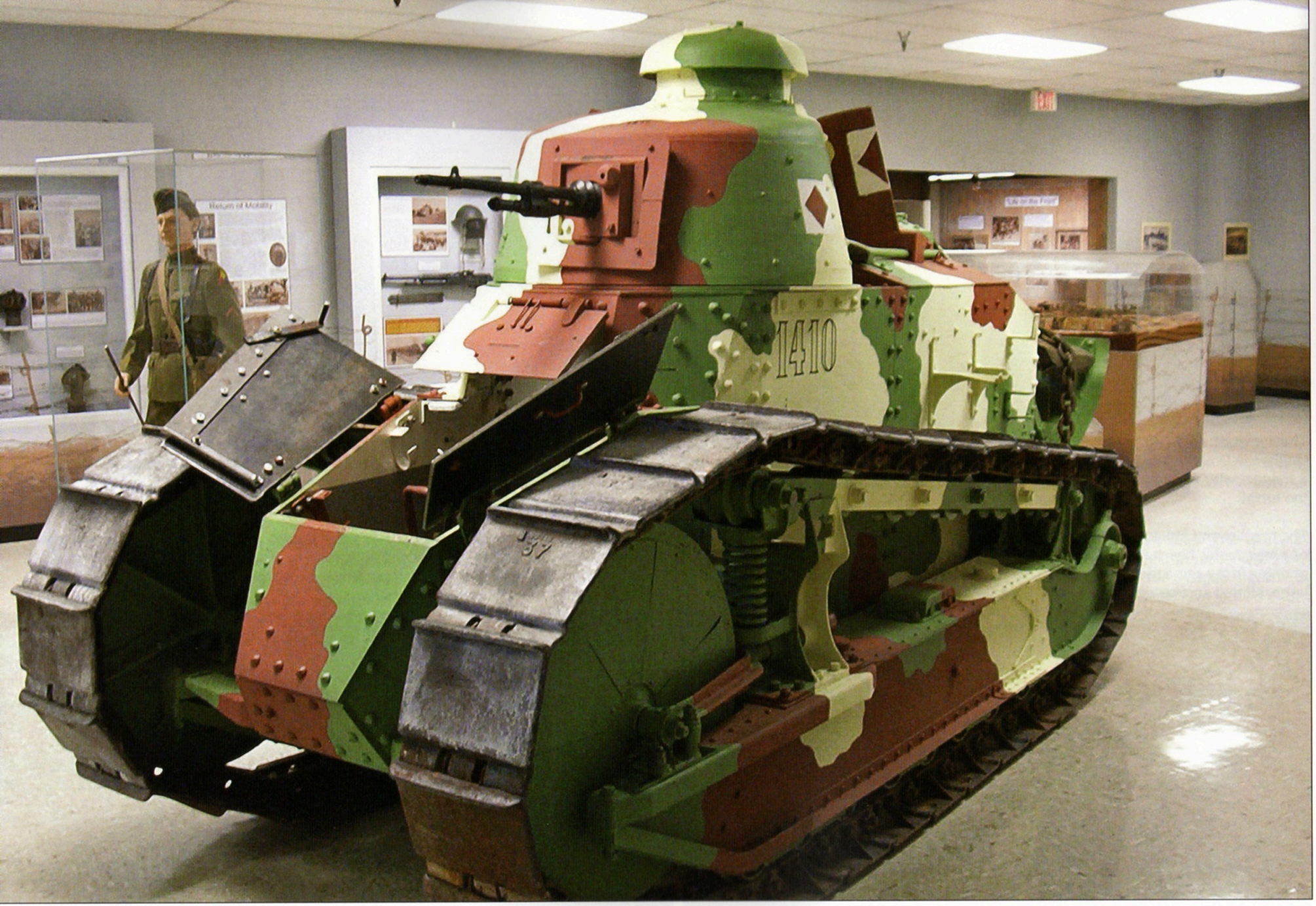
The turret of an FT-17 undergoing conservation work is viewed from the right side. Unlike the Omnibus-style turret of "Five of Hearts," the Omnibus turret of this tank had a mantlet with wrap-around sides and top that overlapped the side plates and roof of the turret.

A view from the turret roof shows the top of the mantlet, with its slightly irregular rear edge. Behind the gun shield are the sight tube and the two shield supports. Below the shield is the front of the hull. The FT-17's turret rested on a ball-bearing race, and the gunner traversed the turret by pushing it around and locking it where desired.

The mantlet and shield are shown from below. On the ball mount of the mantlet, a piece of sheet metal has been attached over the opening for the 37mm gun. The figure-8 opening in the gun shield accommodates the 37mm gun and its recoil cylinder. The two large, slotted screws on the gun shield secure it to the two mounting cylinders.

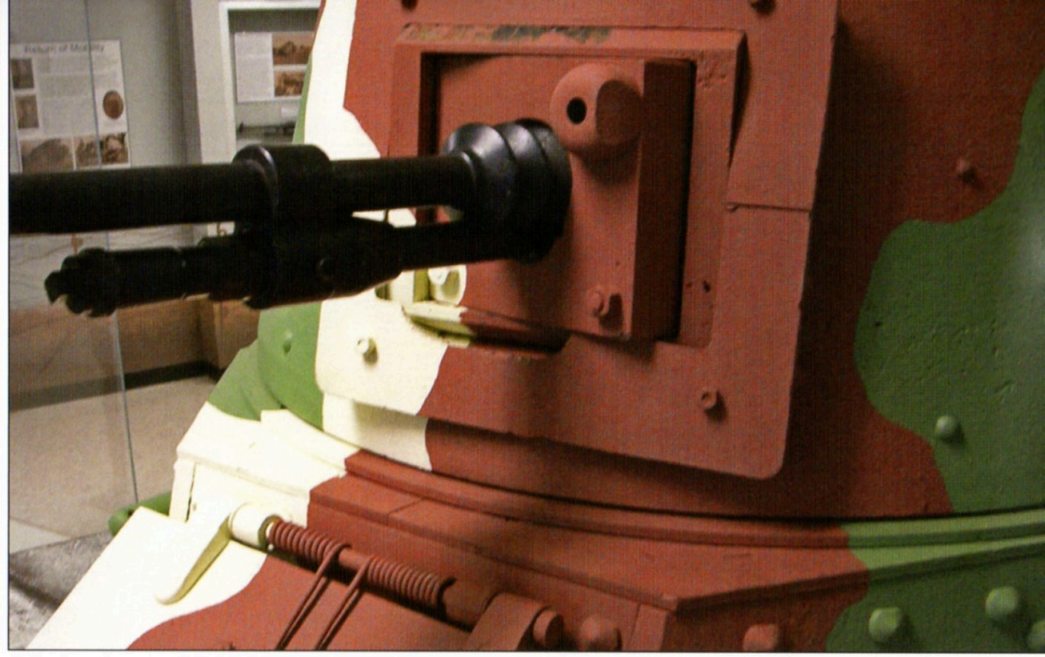
This view of the right front end of the FT-17 undergoing conservation work emphasizes the intricate design of the idler wheel, with its mosaic of triangular and hexagonal wooden pieces. The design of the track girders and the manner in which the track shoes slightly overlap each other are also apparent.





In 2003, Major Robert Redding of the Colorado Army National Guard found two partially dismantled FT-17 tanks in a junkyard in Kabul, Afghanistan. With the permission of the Afghan government, the two tanks were sent to the Patton Museum of Cavalry and Armor in the United States. This example has been restored and was photographed while on display at Fort Knox. It has been painted in a three-color camouflage scheme of olive green, dark red, and sand. The number 1410 is painted on the sides of the hull in black outline, and a tactical or unit symbol of a red diamond in a white square is painted on the sides and rear of the turret. (Don Moriarty)

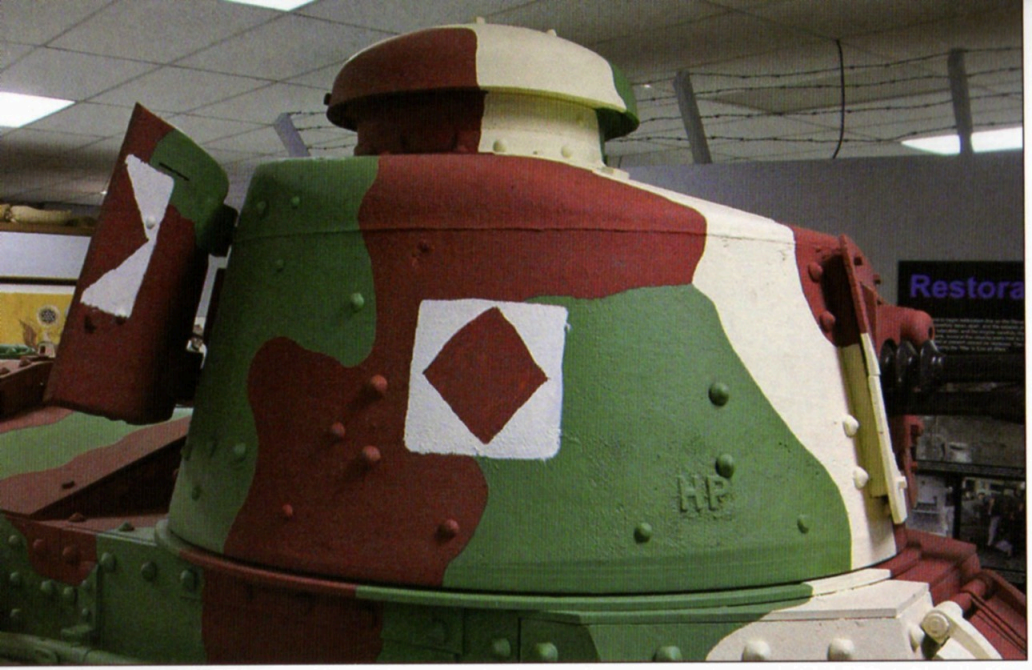
The turret is the type commonly referred to as the Berliet turret. Introduced in 1918, it consisted of a cast roof attached to a forged turret body. The cupola with the hinged ventilation cover was a separate assembly fastened to the turret roof. A Hotchkiss 8mm machine gun has been installed in the turret. (Don Moriarty)



The Hotchkiss machine gun mount was attached to a square mantlet fitted with a protruding gun sight opening. To bring the gun onto a target, the commander/gunner would push the turret in the direction of the target, lock the turret, and then fine-tune his aim by swiveling the gun from side to side and up or down. (Don Moriarty)

Viewing down the business end of the air-cooled Hotchkiss machine gun, it can be seen from the angle of the mantlet that the gun has been swung to the right of the centerline of the turret. The tank carried up to 4,980 rounds of 8mm ammunition. The Berliet turret could also accommodate the 37mm Puteaux SA-18 L/21 gun. (Don Moriarty)

The outer mantlet shield was fabricated with two pieces of armor, with a horizontal joint between the two plates. Two nuts and bolts secure each plate in place. At the top, the welded seam between the roof and the body of the turret is visible. Note the slightly rough texture of the side of the turret and the smoother texture of its base. (Don Moriarty)

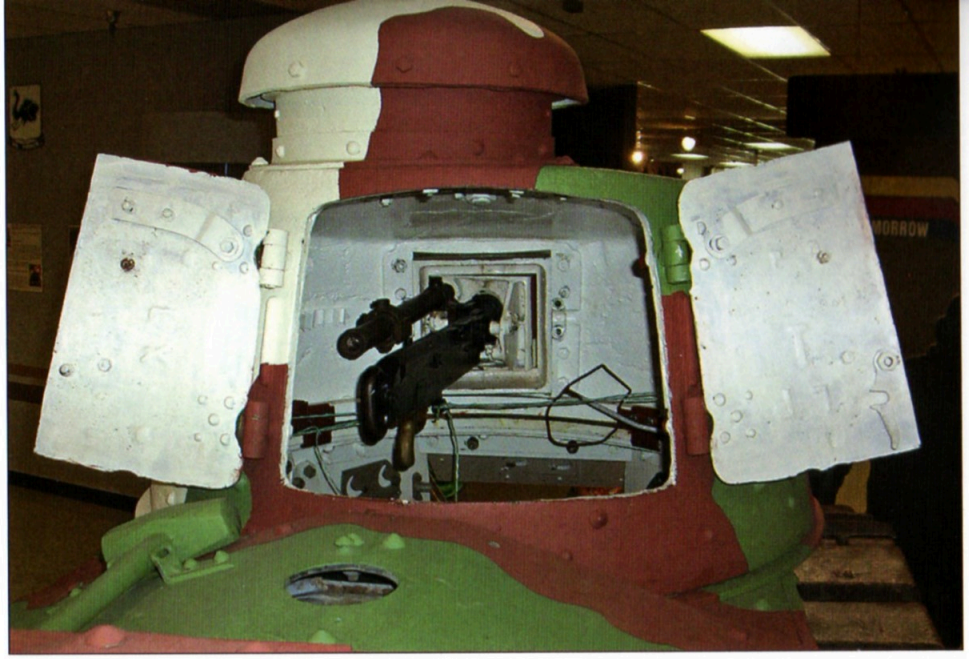


This view exhibits the distinctive profile of the side of the Berliet turret. By contrast with the turret of the first 150 Renault FT-17s, the Berliet's roof had much less slope toward the front, and the cupola was significantly shorter. A casting mark, "HP," is in large block letters on the side of the turret. (Don Moriarty)

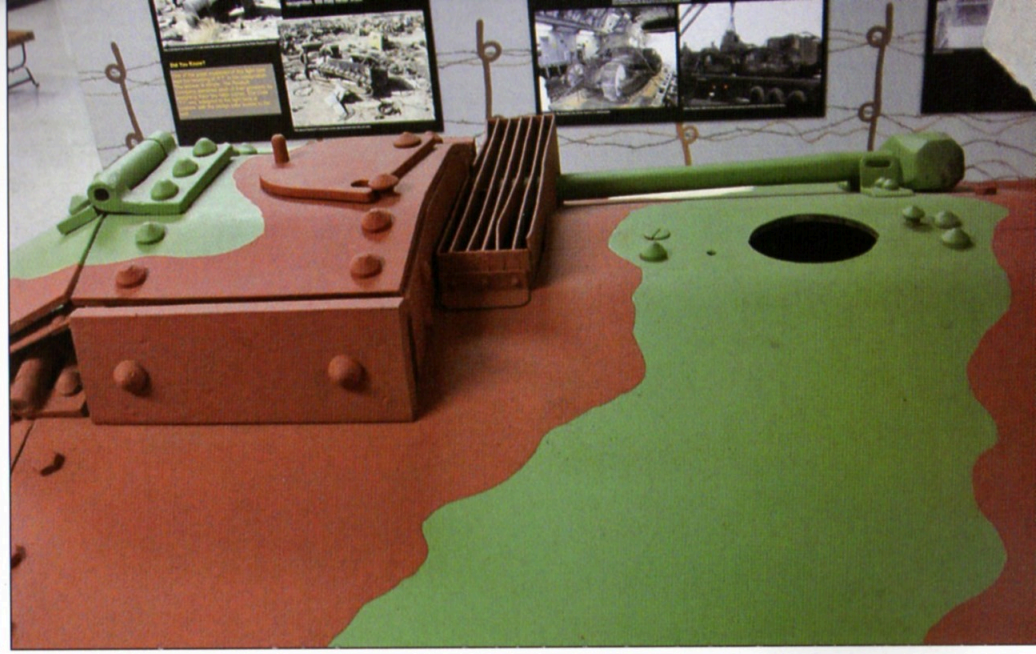
The right door on the rear of the turret is shown open. The two doors were curved to match the contour of the rounded turret. At the top of the door is a vision slit. On the inside of the door, the opening for the slit was beveled on all sides, allowing the commander/gunner a wider field of vision than if the slit were not beveled. (Don Moriarty)

The interior of the right door of the turret is painted white. The rivets on the left side fasten the hinges to the door. To the right is a simple latch secured with a hex nut, used to hold the two doors together when closed. Faintly visible on the door are casting marks: the letters LP and the number 1. (Don Moriarty)

With the turret doors open, the thickness of the turret wall is visible. The wall was nominally 7/8" thick, while the roof was 5/8" thick. Inside the turret, a hand hold and a stowage hook are visible. A number that begins with 1889-26 is stenciled on the inside of the turret wall in black paint. (Don Moriarty)

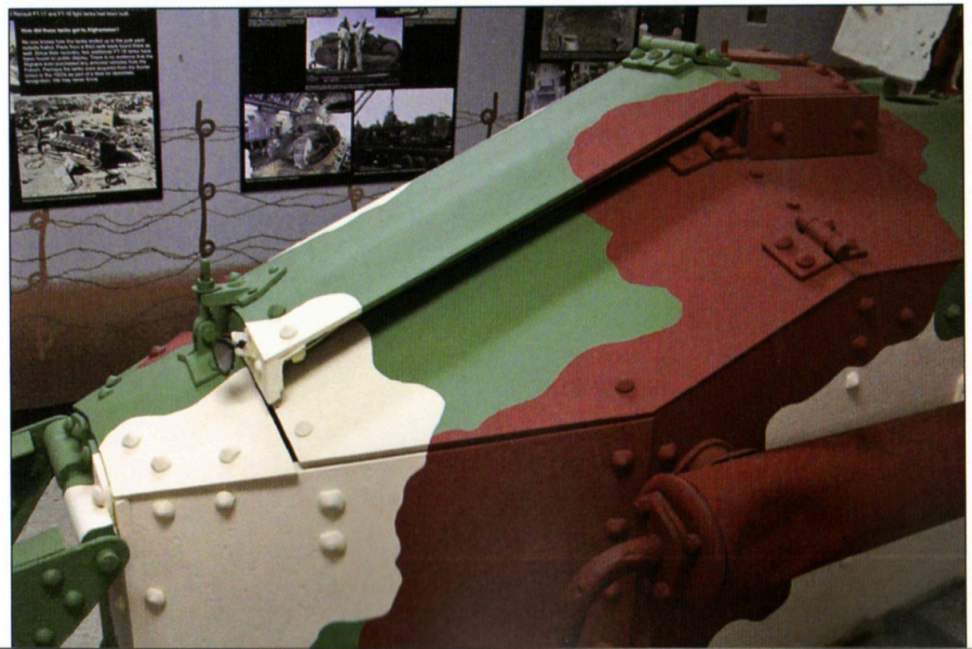


Pivoting metal strips covered the insides of the vision slits in the doors, to prevent fragments from entering the slits. Visible inside the turret is the Hotchkiss 8mm machine gun, with its tubular gun sight to the left of it. Also in view is the inner side of the gun mantlet. Note the absence of a rear vision slit in the cupola. (Don Moriarty)



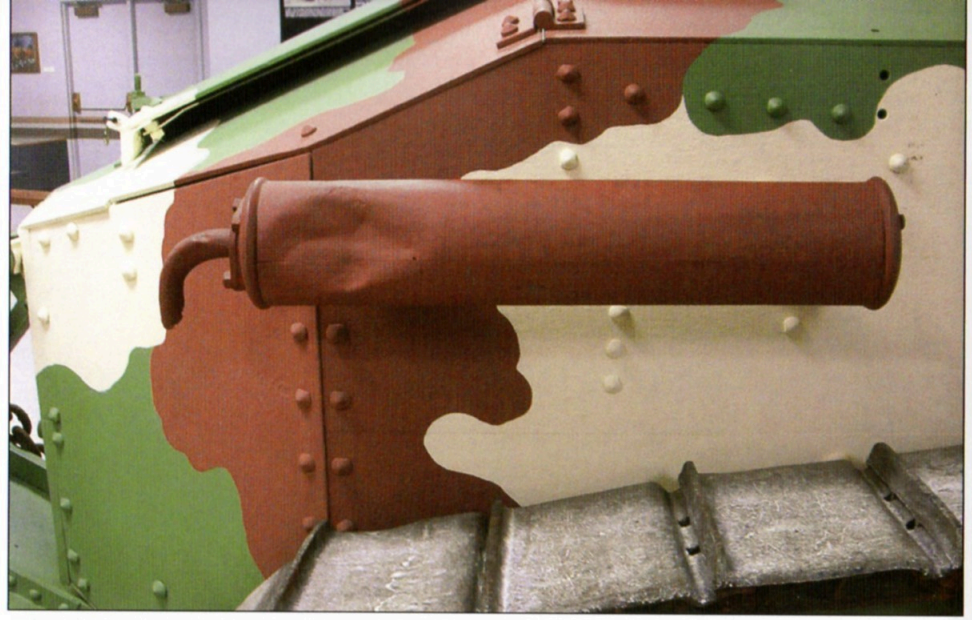
On the deck to the rear of the turret are, left to right, the hinge for the center engine compartment cover; the armored housing for the radiator filler, with the radiator filler access plate on top; the radiator air inlet grille; and the fuel filler opening, with its cover missing. A sledgehammer is stowed on the deck. (Don Moriarty)

As viewed from the right rear of the FT-17, the center and right covers for the engine compartment are visible. Good details are available for the toggle bolt and nut that latched the rear of the center cover. The tail pipe and part of the muffler are to the lower right. The upper pin for the tail is at the lower left. (Don Moriarty)



The Patton Museum of Cavalry and Armor's FT-17 is viewed from the right rear, showing the positioning of the muffler. The rear towing shackles are installed, and a heavy tow chain is fitted to the eyes and draped over a folded tarp on the tail. The rearmost plate of the hull is actually two plates with a horizontal joint between them. (Don Moriarty)

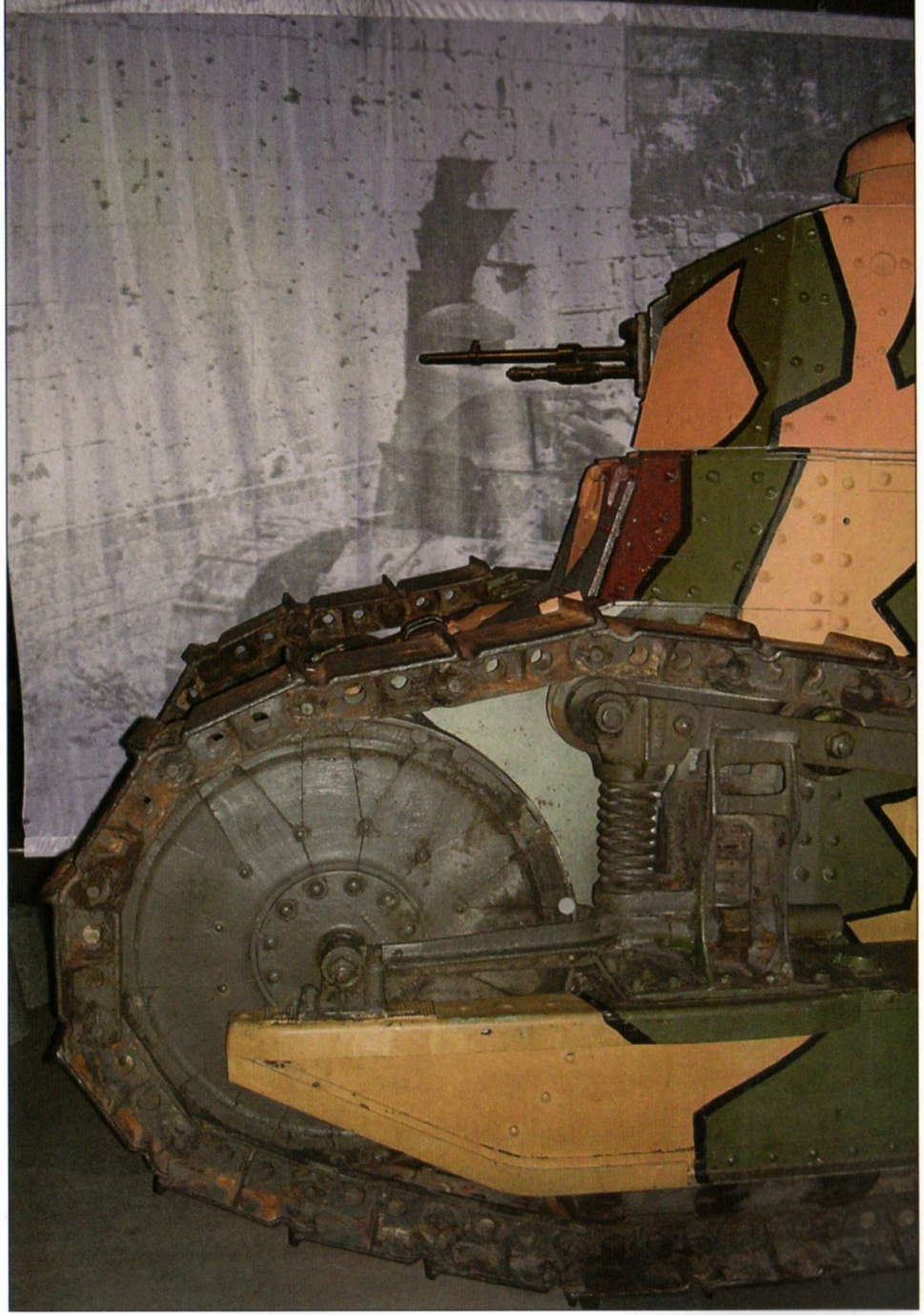
The muffler is viewed from directly to its rear. The tailpipe includes a flange that is secured with two nuts to the rear of the muffler. The tailpipe is corroded, with several dents and holes in it. Also visible is the rear muffler support, a tube with a mounting flange secured to the hull with hex nuts. (Don Moriarty)



The side of the muffler suffered a blow that left a large dent. Above the tracks, which have a pitted texture, a subtle horizontal seam is visible between the upper and lower plates of the hull. Also noteworthy is the design of the raised center cover of the engine compartment. (Don Moriarty)

The left engine-compartment cover is missing from the FT-17 in the Patton Museum of Cavalry and Armor. The left side of the engine compartment is therefore exposed. The thinness of the sheet metal that comprises the skid of the tail assembly is evident. Joining the two lengths of tow chain together is a large, teardrop-shaped tow ring. (Don Moriarty)

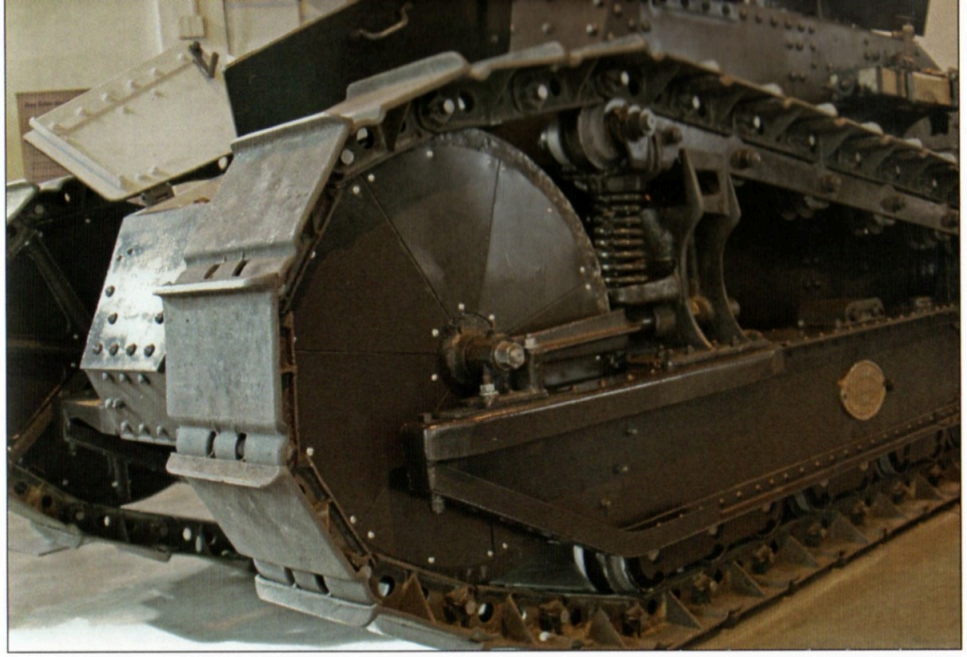
In this view from under the front of the FT-17, to the left and right are the brackets for the coil springs that suspend the hull from the bogie beams. A square strut passing through each bogie coil spring is attached to the bottom of the corresponding bogie beam. Various types of bolt and nut combinations are used on the armor plates. (Don Moriarty)



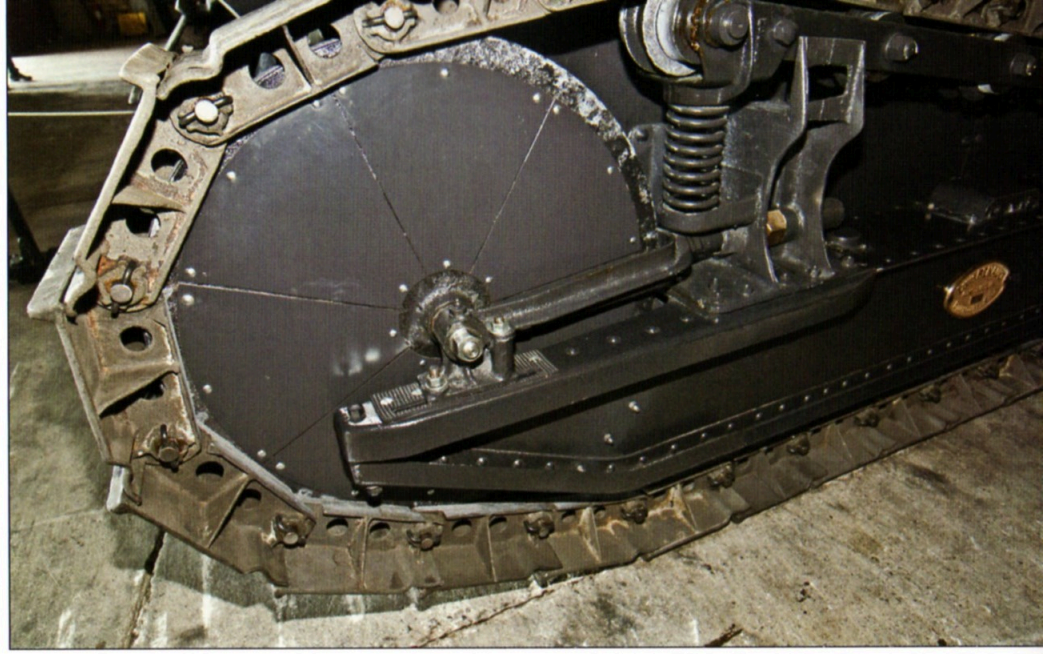
This FT-17 in an Australian collection features a three-color camouflage scheme of green, reddish brown, and tan, with the colors separated by a black border. Fitted in its octagonal turret is a Hotchkiss machine gun. The idler wheels are of original construction: wood disks, painstakingly pieced together, with steel hubs and rims. (Neal Haydn)

The front end of this vehicle displays the typical components of an FT-17, from the driver's steps with nonskid treads to the three-panel driver's doors. The running gear of this FT-17 is well worn and begrimed. Several different casting marks are visible on the track shoes. (Neal Haydn)

The Panzermuseum, Thun, Switzerland, is home for this Renault FT-17, shown here while on loan to the Burgdorf Armeemuseum. The Swiss are known to have purchased two FT-17s in 1922 and three in 1939; it is possible this FT-17 was one of those five vehicles procured before World War II. Restoration of the tank began in 2006 and was completed in May 2009. The tank is in running condition. Previously, the tank was unarmed, but now a Swiss MG11 7.5mm machine gun of World War I vintage is mounted. In this photo, with the driver's doors open, a view is offered of the driver's compartment. The tank is painted black overall. (Massimo Foti)



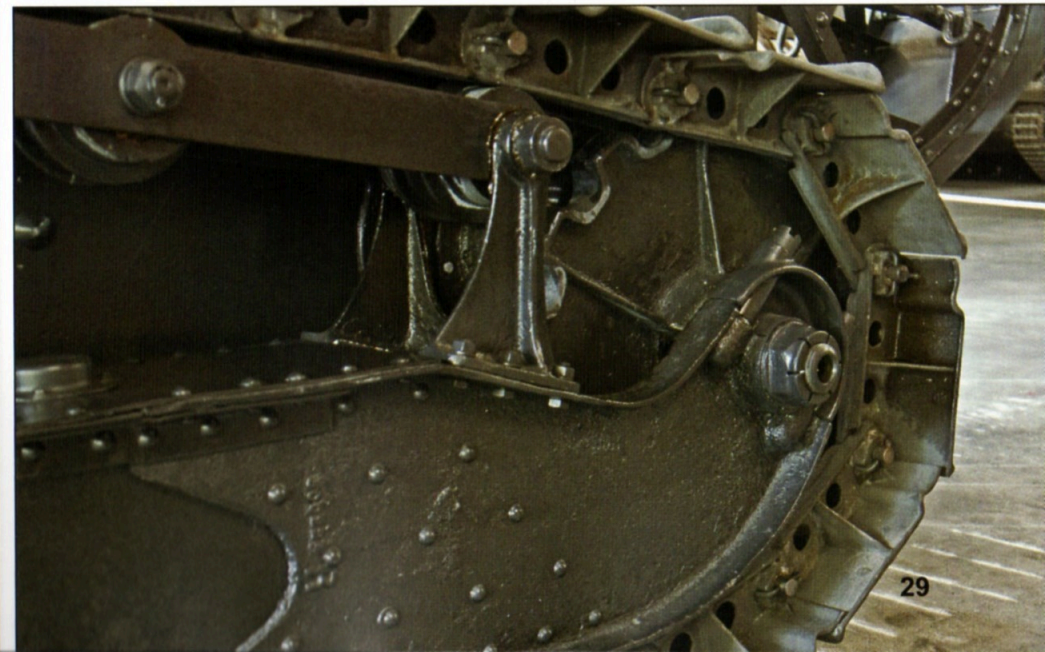
The wooden parts of the idlers of the Thun FT-17 were replaced with metal plates. Bright-metal screws were used to fasten the plates to the wheels. During restoration, modern replacement parts were sometimes used. The original tracks are still intact. The track shoes were left in bare metal. (Massimo Foti)

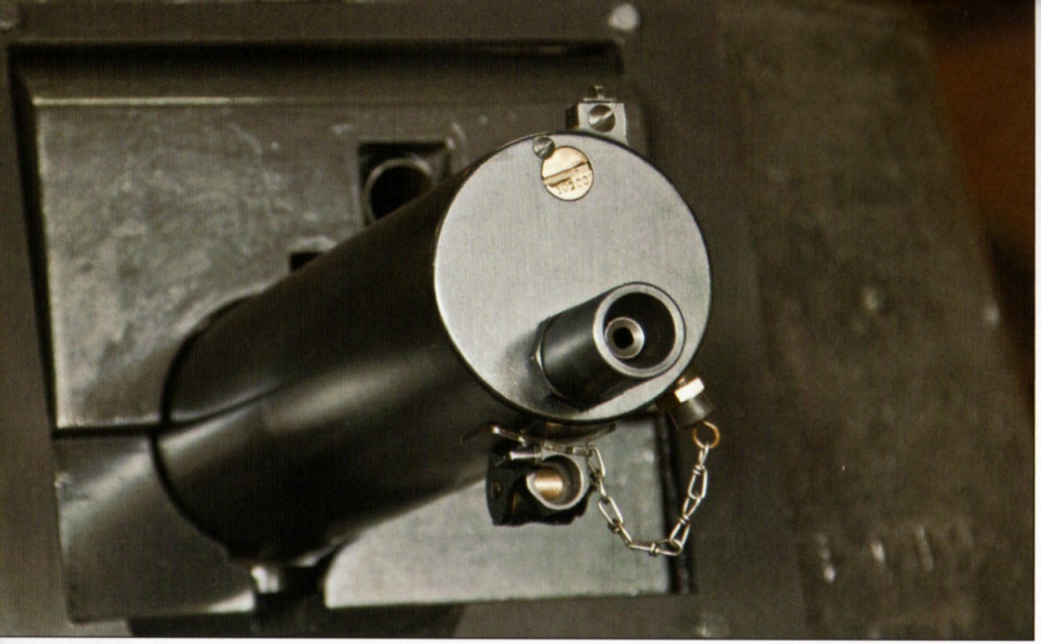


Each side of the front of the Y-shaped idler yoke incorporates a wheel bearing as well as a mounting bracket on the underside. To adjust the track, the nuts on the mounting brackets are loosened, the large nut toward the rear of the yoke is turned to achieve proper tension, and the mounting bracket nuts are tightened. (Massimo Foti)

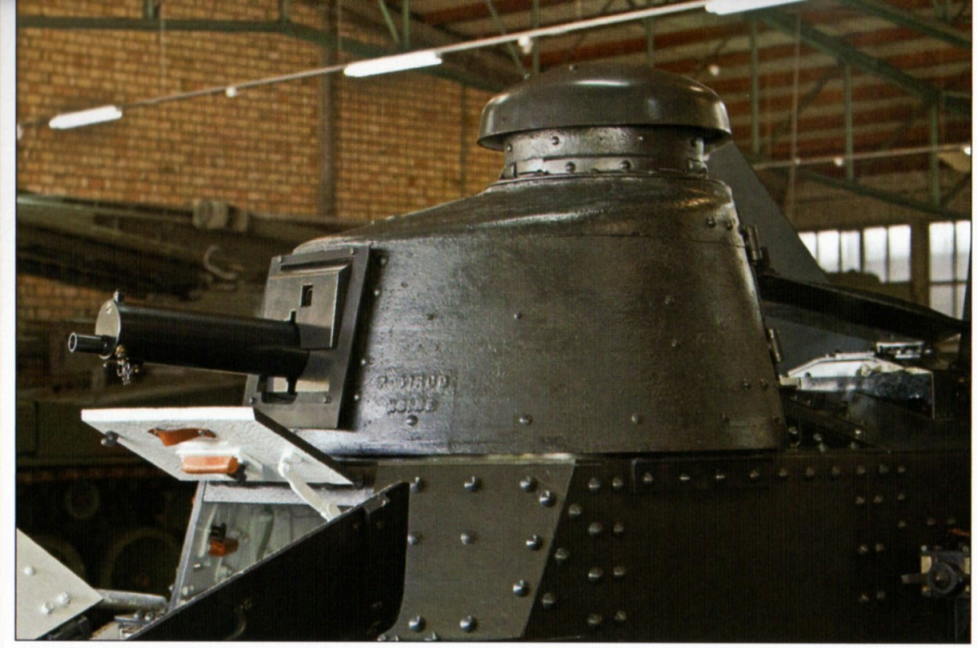
Typically, an oval name plate was affixed to the center of the left bogie beam of Renault FT-17s. This one reads, "Louis RENAULT / Billancourt, Seine". On the flat rectangle below the center of the plate is inscribed "1919 / 2009", presumably the dates of production and restoration of the tank. (Massimo Foti)

The rear of the left bogie beam is emphasized, showing the drive sprocket, the sprocket bearing, and the bracket supporting the rear of the return roller beam. The sprocket is a casting with a raised outer rim and integral "spokes" for added rigidity. Signs of rubbed-off paint are visible on that raised rim. (Massimo Foti)





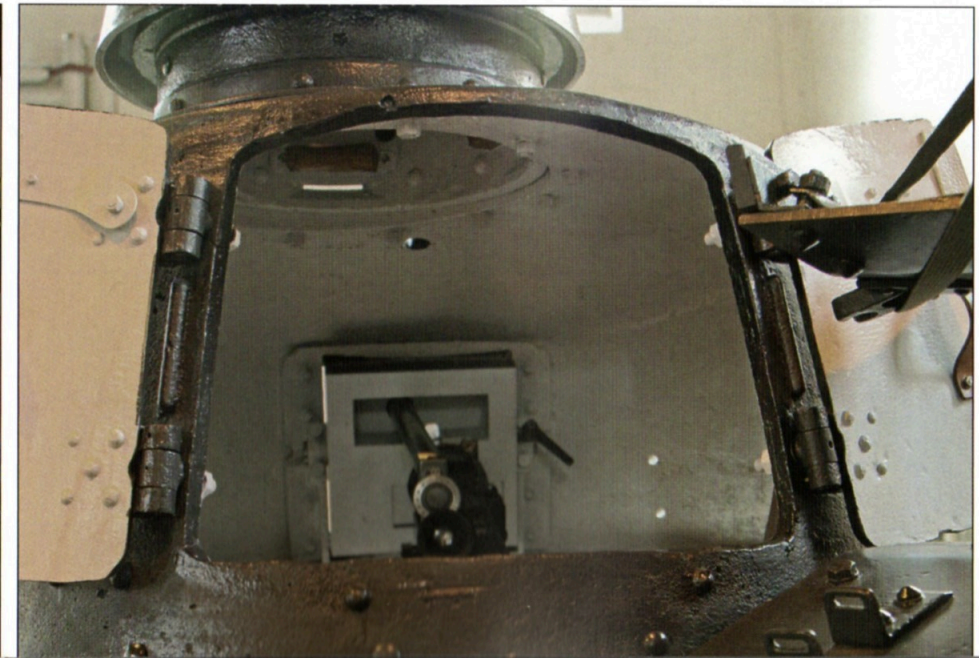
Protruding from the mantlet of the FT-17 at Thun is a Swiss MG11 machine gun. As this was a water-cooled machine gun, it features a cooling jacket. On the front of the jacket is the fitting for a coolant water hose (not installed). The chain acts as a retainer for the plug for that fitting. (Massimo Foti)

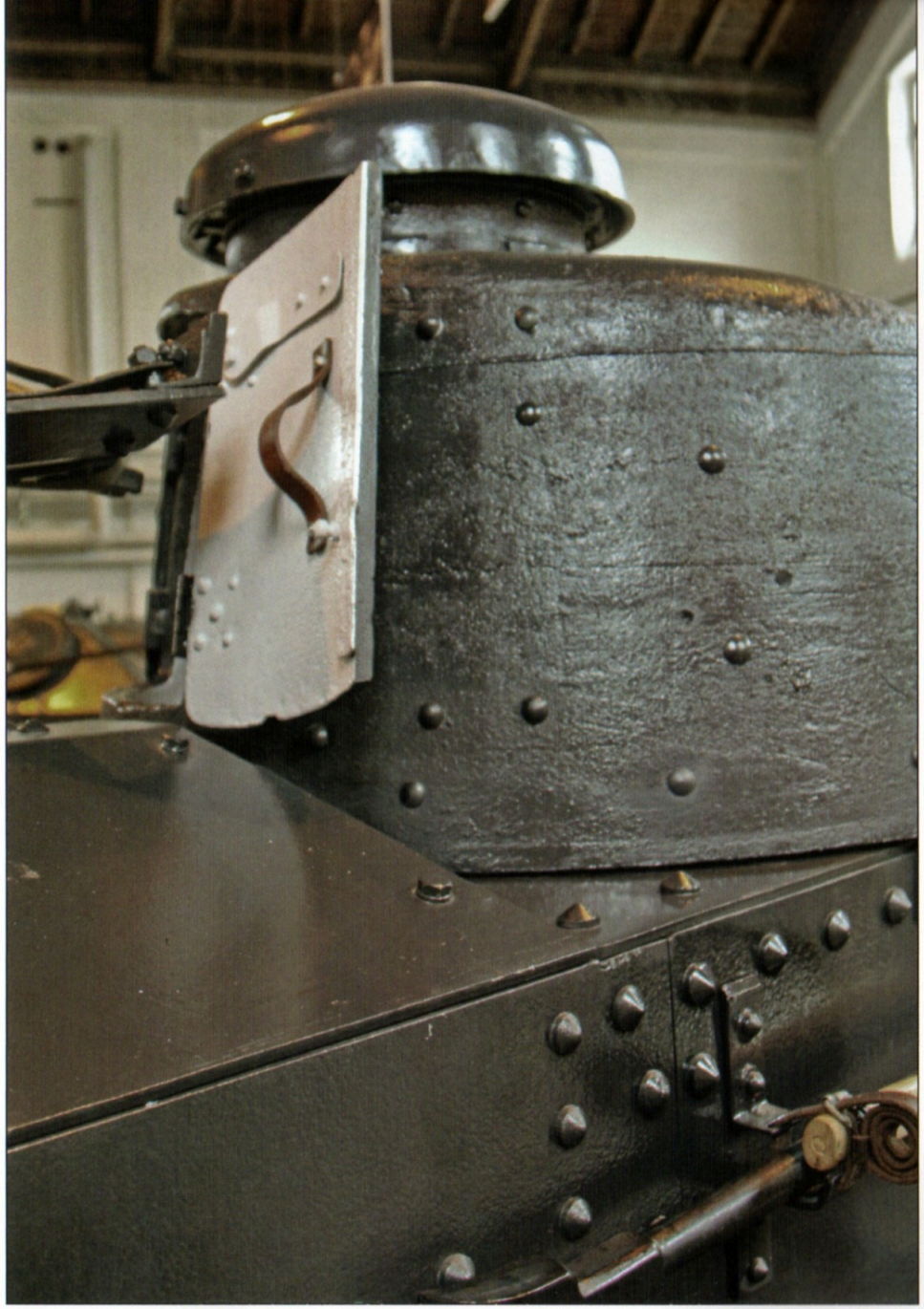


At left is the inside of the raised driver's upper door. Above and to the right of that door on the side of the turret in raised letters is "P GIROD / UGINE," signifying that the turret was fabricated by Aciéries Paul Girod in Ugine, France. Note the front vision slit of the cupola, visible in the cutout in the mounting flange of the cupola. (Massimo Foti)

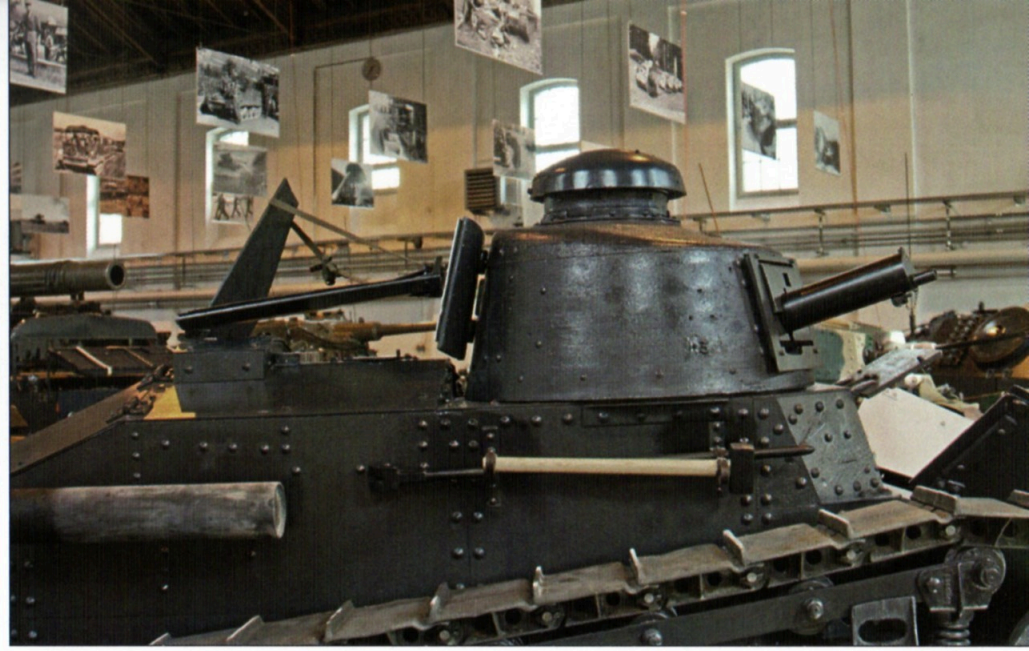
The rear doors of the FT-17 at Thun have been fitted with leather handles and, on the left door, what appears to be a nonoriginal latch. Toward the top of the left door is a metal cover that prevented splinters and fragments from entering the vision slit. To open the pivoting cover, the commander simply pulled down on it. (Massimo Foti)

A view inside the turret reveals details of the interior of the cupola. Arranged around the opening into the cupola are hex nuts and bolts, which are attached to the circular retainer riveted around the base of the exterior of the cupola. Above the vision slit in the cupola is a crash pad. (Massimo Foti)



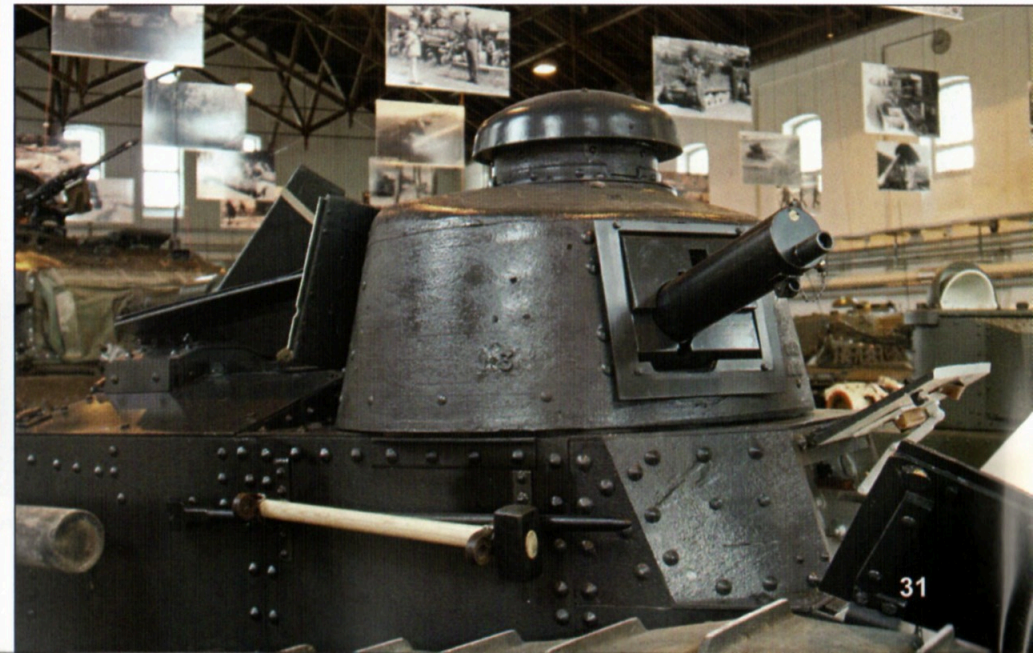


The right door of the turret has a leather handle and a cover for the vision slit. The cover on top of the cupola is hinged at the rear and could be opened partially to admit ventilating air into the cupola. The surface of the cover is quite smooth in comparison to the texture of the cupola and turret. (Massimo Foti)



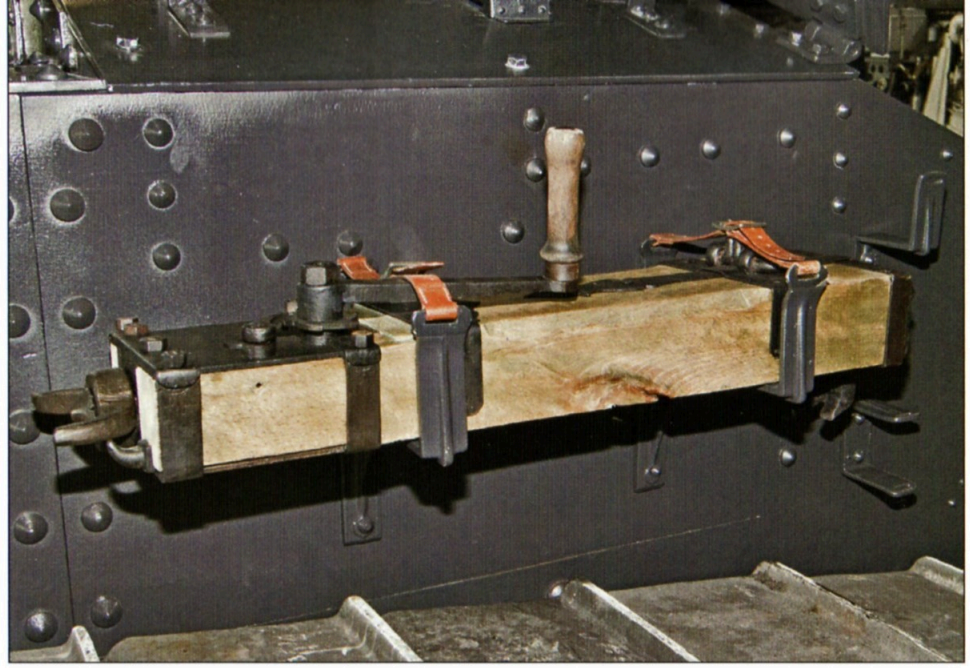
A side view illustrates the shape of the Berliet turret, with its cast roof and forged sides. To the lower left is part of the muffler. To the immediate rear of the turret, and above the rear deck, is the open center cover for the engine compartment. Stowed on the side of the hull are a sledgehammer and a crowbar. (Massimo Foti)

A raised casting number, 3, is visible on the side of the turret. On the circular retainer that holds the cupola to the roof of the turret, there is a cutout at the front, at the bottom of which the front viewing slit is visible. Another vision slit is faintly visible on the oblique plate below the machine gun. (Massimo Foti)



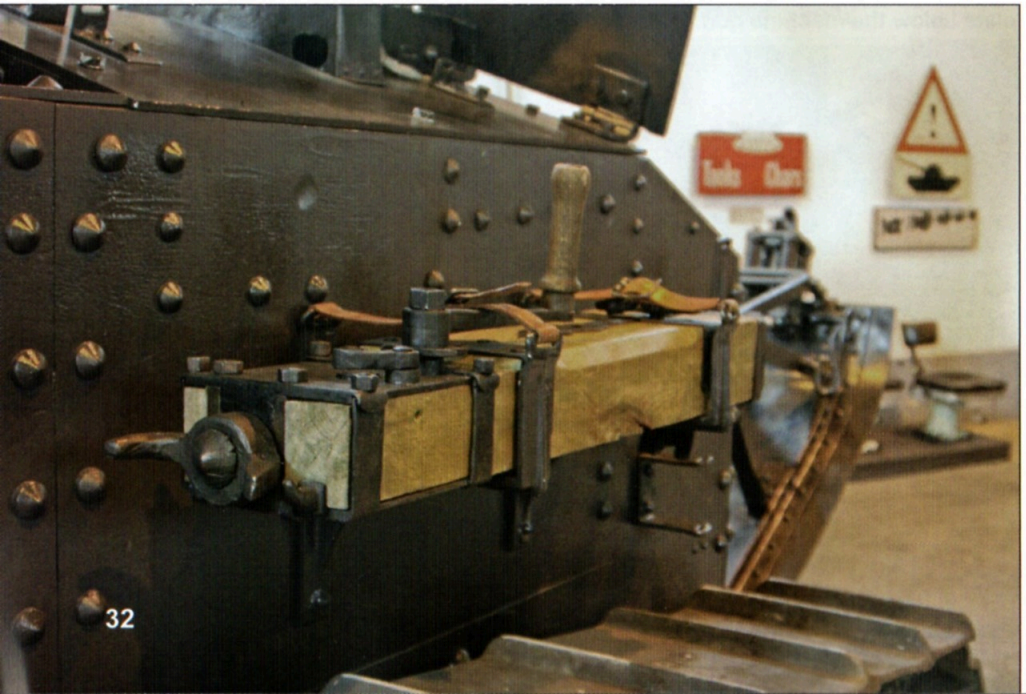
Both the left and center engine compartment covers are open, while the right cover is closed. The strapping around the left cover is holding the center cover in place. Protruding from the rear plate of the hull is the starter fixture. A hand crank was attached to this fixture and turned in order to start the engine. (Massimo Foti)

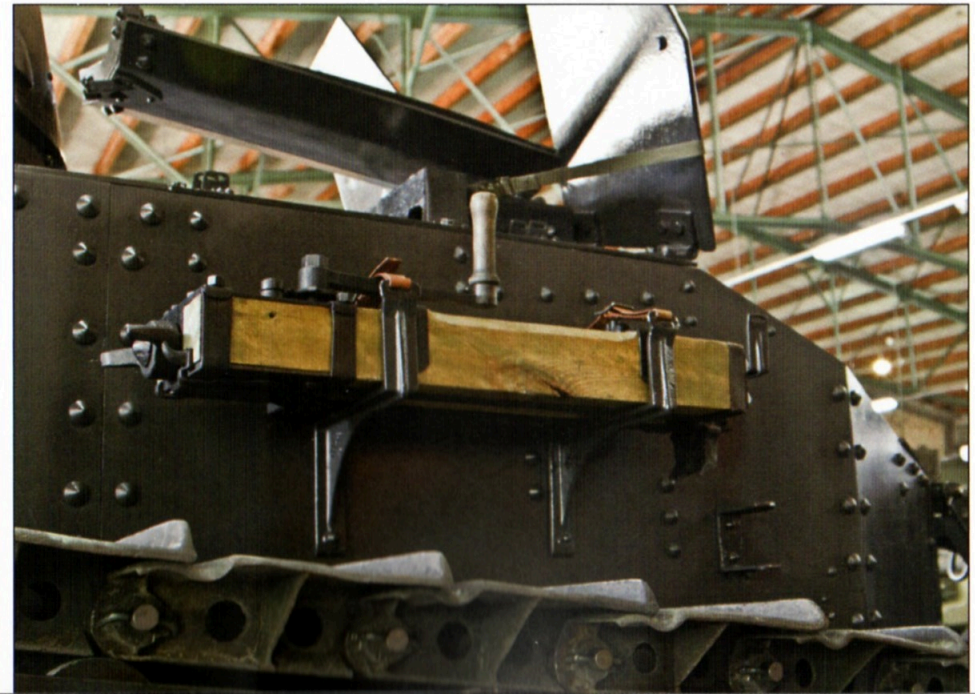
The jack is shown from the front. On the sloping deck above the jack are several brackets for tools (left), the radiator air intake, and the radiator filler housing. (Massimo Foti)



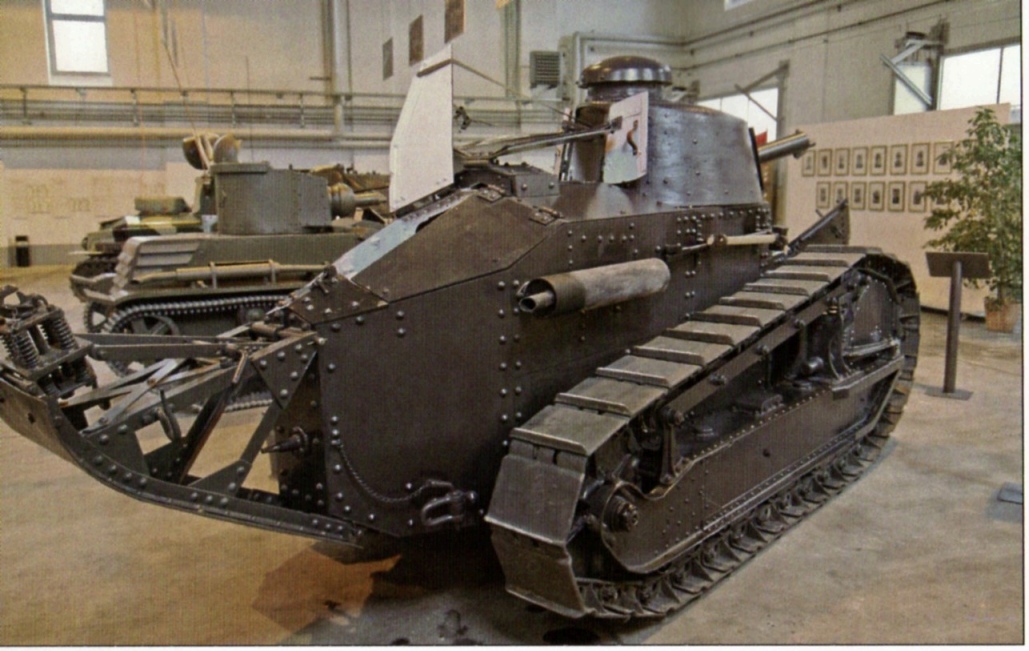
A wooden jack has been stowed on the brackets that normally held a toolbox. There are slots in the tops of the brackets for retainer straps. (Massimo Foti)

The tool box brackets, shown here supporting a jack, are steel castings. The brackets have a t-shaped cross section, which is not only more decorative, but also provides the needed strength with less weight than is possible with simple rectangular cross section castings.





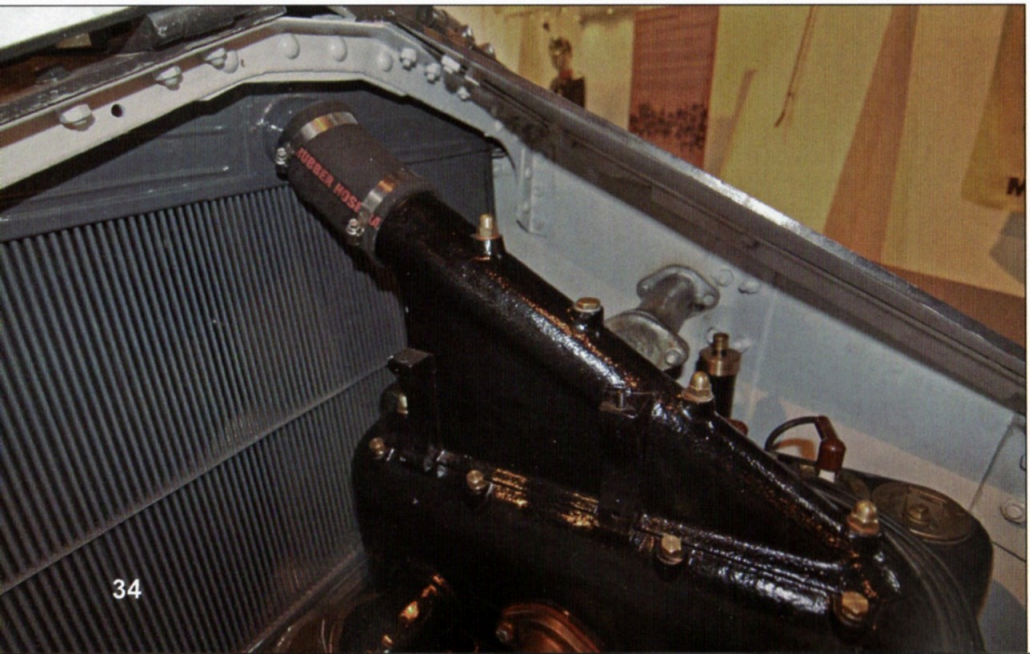
The engine compartment of the FT-17 is accessed through three hinged panels on the rear deck of the tank. Here, all three panels – the two large sections on either side in addition to a small center section (not visible) – have been raised. (Massimo Foti)



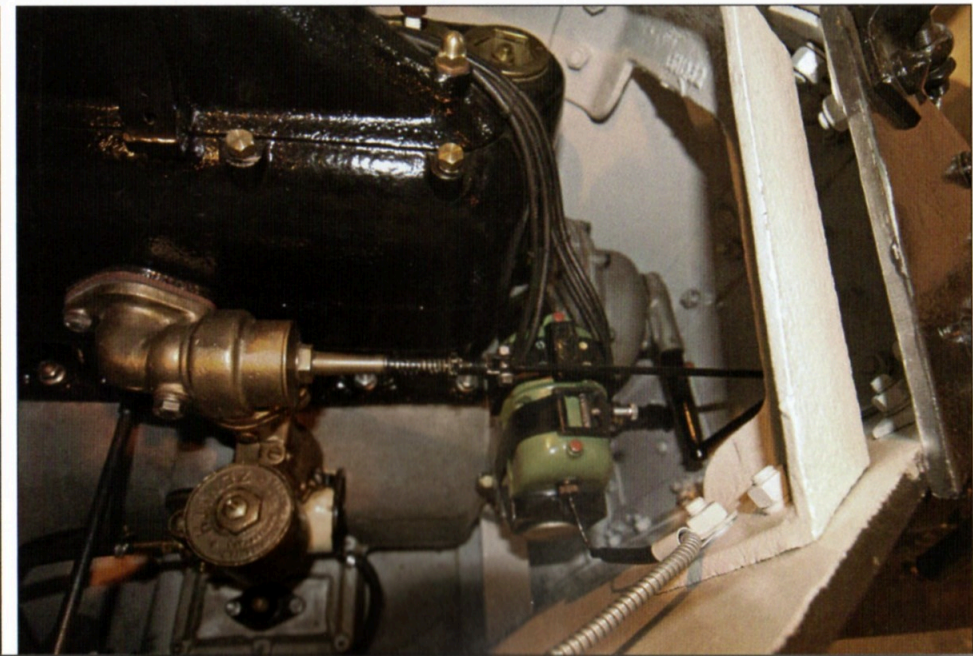
The right engine compartment cover is shown closed in this right-rear view of the FT-17 at Thun. A tow shackle is fitted to the lug near the lower rear of the hull, and a retainer chain is attached to the shackle pin. This FT-17 was fitted with a towing rig on the rear of the tail assembly. (Massimo Foti)

This photo shows the spacing between the front ends of the left and right engine compartment covers. When closed, these covers met at their rear ends, creating a triangular-shaped opening between them. The raised center cover allowed ventilation air to pass through that opening. (Massimo Foti)

The open left engine compartment cover allows a view of the Renault 4-cylinder liquid-cooled engine. To the left is the radiator. The water line is routed diagonally from the top of the radiator to the top of the engine. The rubber connector on the water line is a recent replacement part. (Massimo Foti)

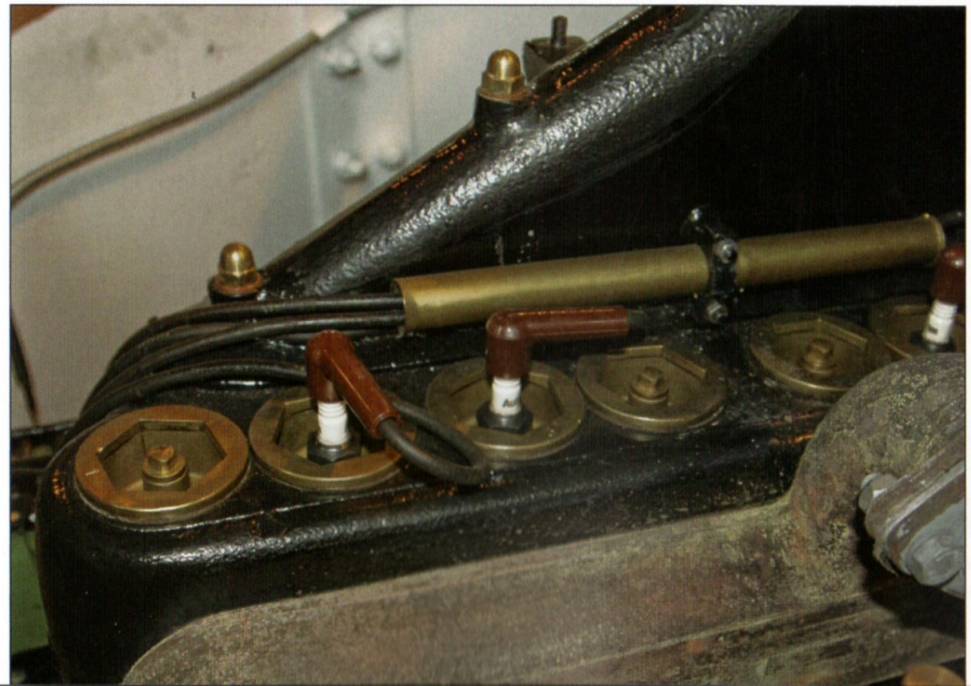


In this view into the left side of the engine compartment, the rear of the compartment is toward the right, and the rearmost plate of the rear deck is to the far right. Bolted to the inside of the engine compartment is a cross-member shaped like an inverted V, designed to give extra structural strength in this sector. (Massimo Foti)



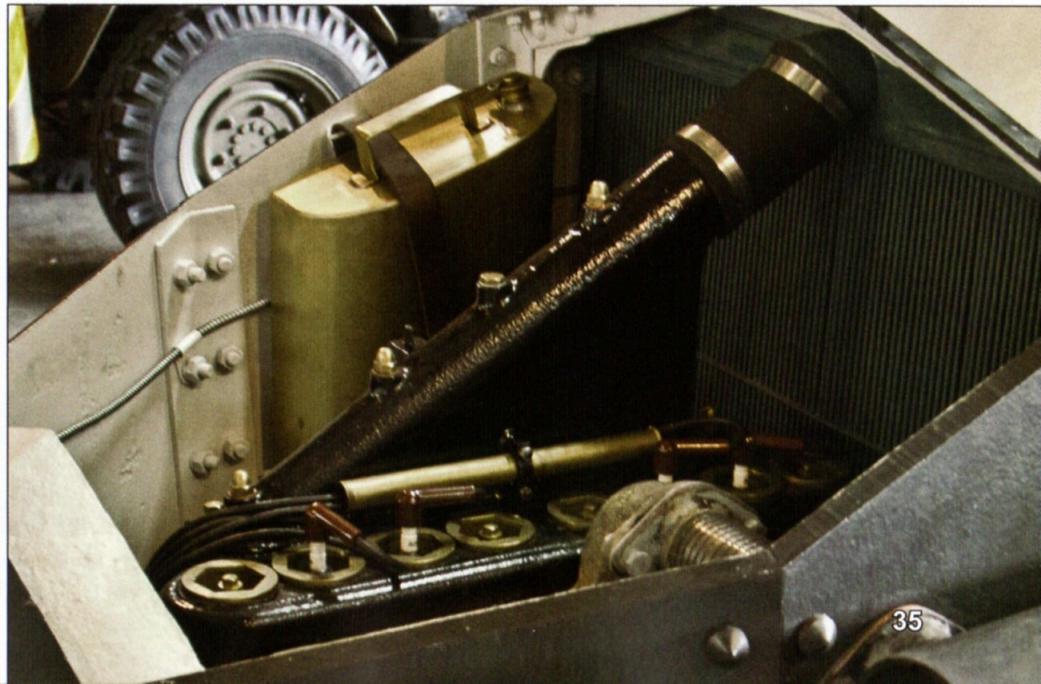
This is the front left corner of the engine compartment of the Thun FT-17, with the white-painted side wall of the hull to the left. The aluminum-colored device with the brass filler cap to the lower left is the left gearbox. Above it is the radiator. The transmission group is out of view to the front of the radiator. (Massimo Foti)

A section of brass tubing protects the spark plug wires as they traverse the length of the cylinder head to the two forward spark plugs. (Massimo Foti)

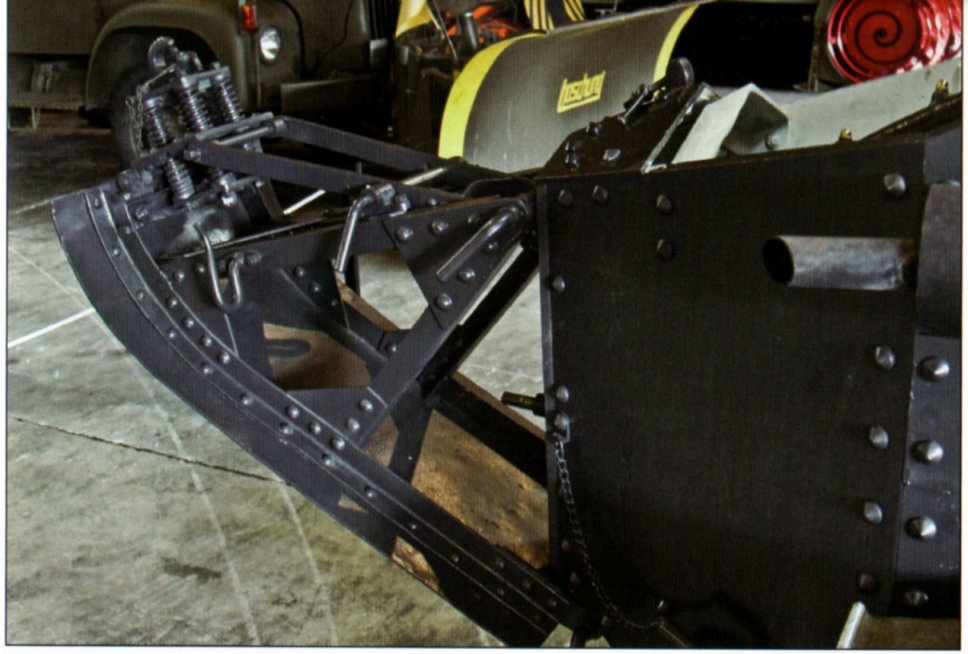


The four-cylinder Renault engine developed 39 horsepower and could propel the roughly seven-ton tank up to nearly five miles per hour. (Massimo Foti)

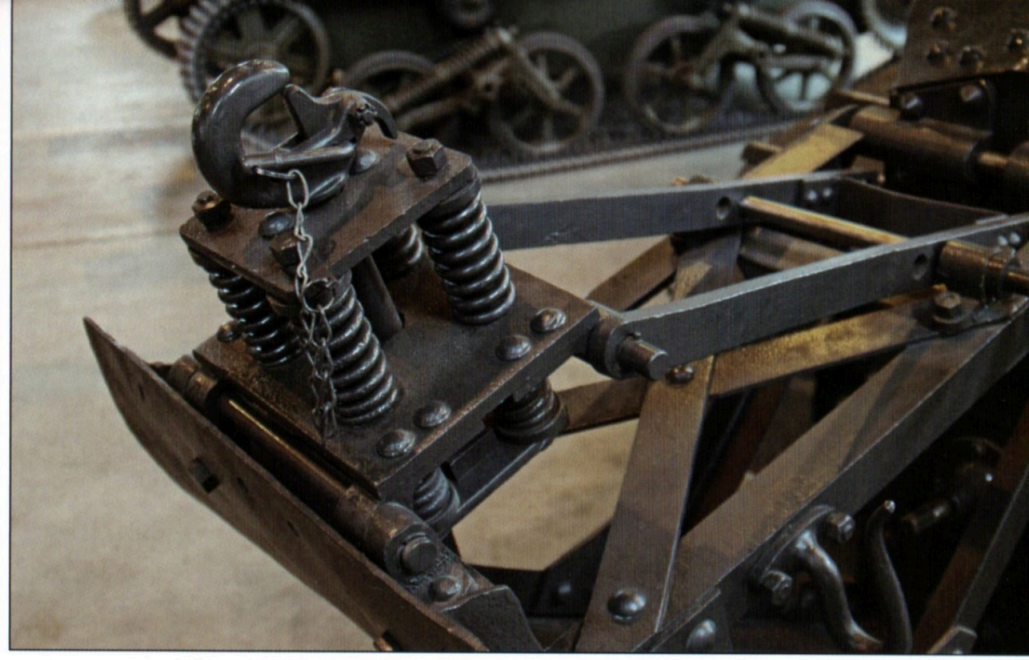
As seen from the right side of the engine compartment, the radiator coolant line is routed to the top of the radiator. At the lower center are the spark plugs and ignition lines, routed through a brass pipe. At the bottom right is the exhaust line, which exits the engine compartment out of the photo to the right. (Massimo Foti)



A strap is being used to secure the two large outer engine compartment covers in the raised position, protecting spectators seeking a closer look. The restoration of this example to operating condition was a three-year process, reaching completion on 29 May 2009. (Massimo Foti)

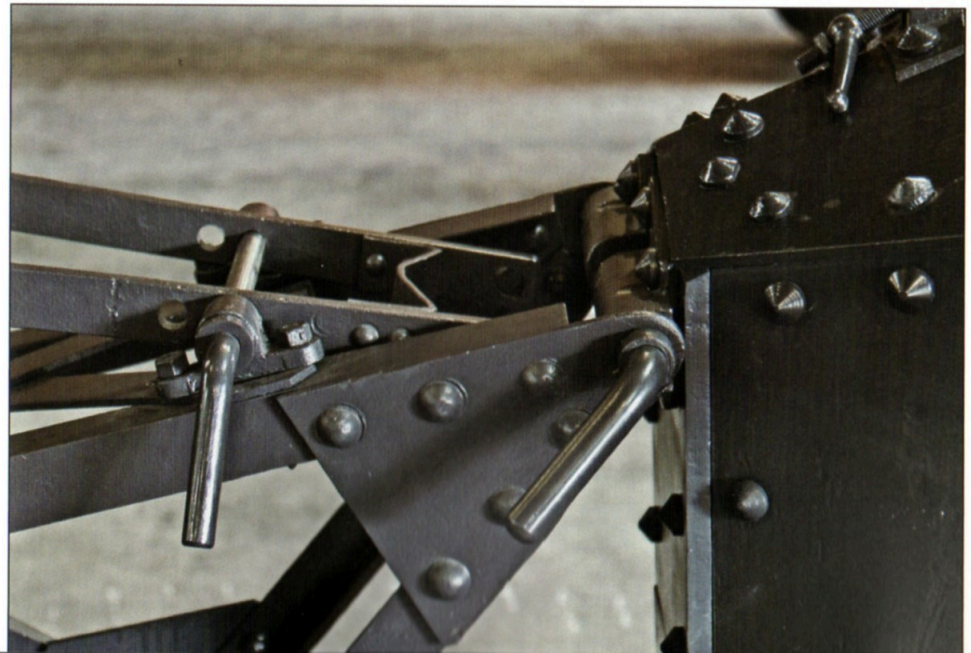


The towing rig consists of a tow pintle mounted in a bracket with three square plates and four coil springs, as well as a brace. The angle of the pintle assembly is adjustable. This type of towing rig has been observed in photographs of the Renault FT-17 in action during World War I. (Massimo Foti)

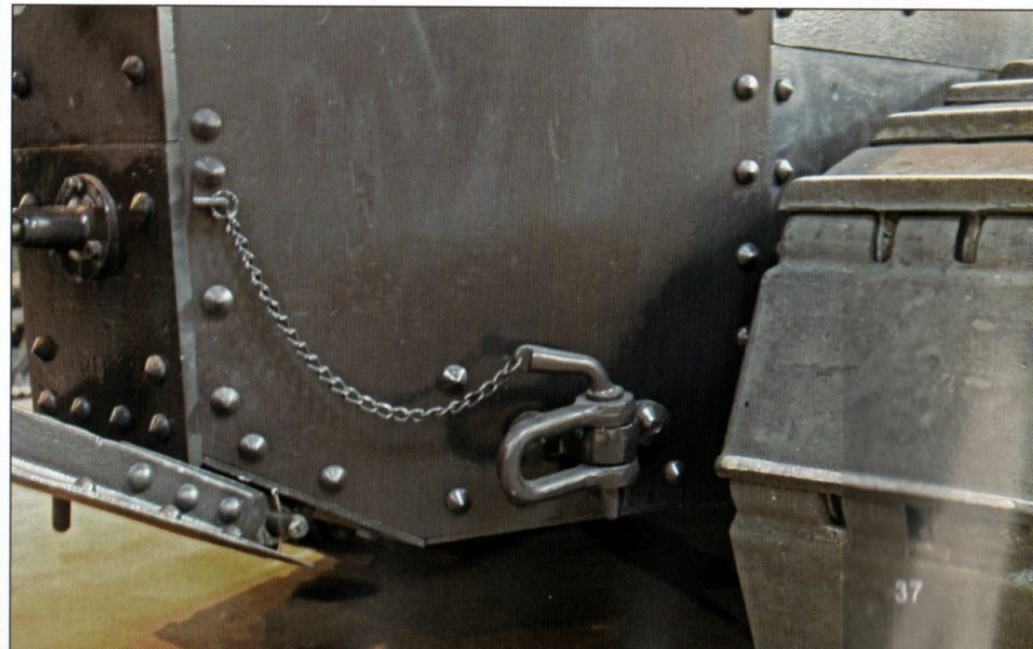


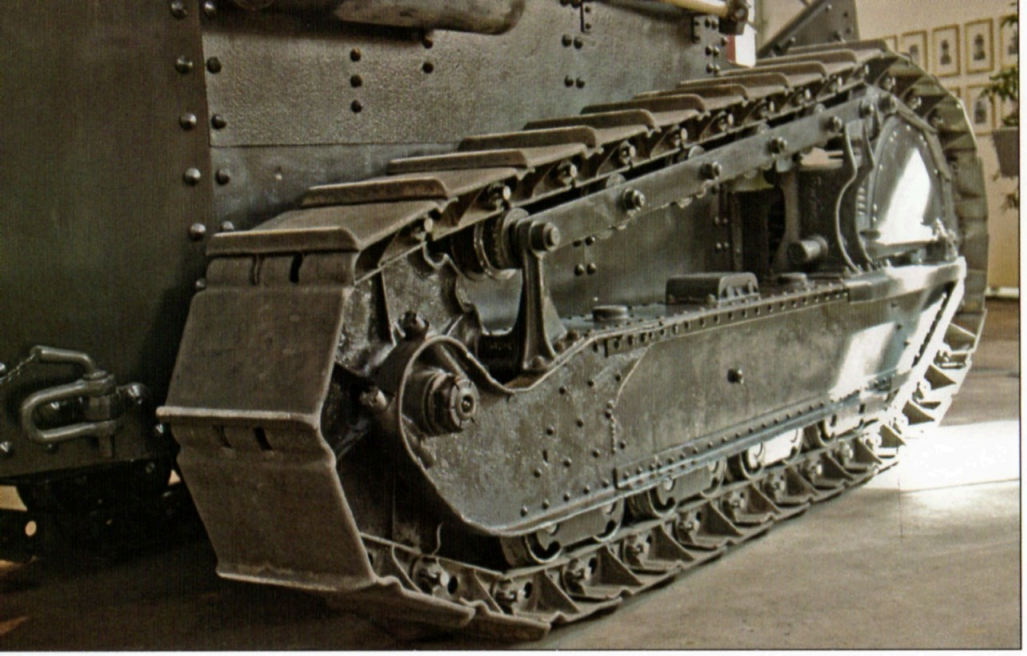
The tow pintle assembly is attached to the rear end of the tail with a pin, allowing the assembly to pivot to different angles. Note the placement of a tow hook on the side of the tail; vintage photographs of FT-17s indicate that such hooks were sometimes, but not always, attached to the sides of the tail. (Massimo Foti)

As can be seen in this photo, there are three sets of holes in the brace of the tow pintle, allowing for setting the pintle at different angles using the L-shaped pin. Using the two holes at the end of the brace would position the tow pintle bracket vertically, the normal angle when towing a trailer or gun. (Massimo Foti)

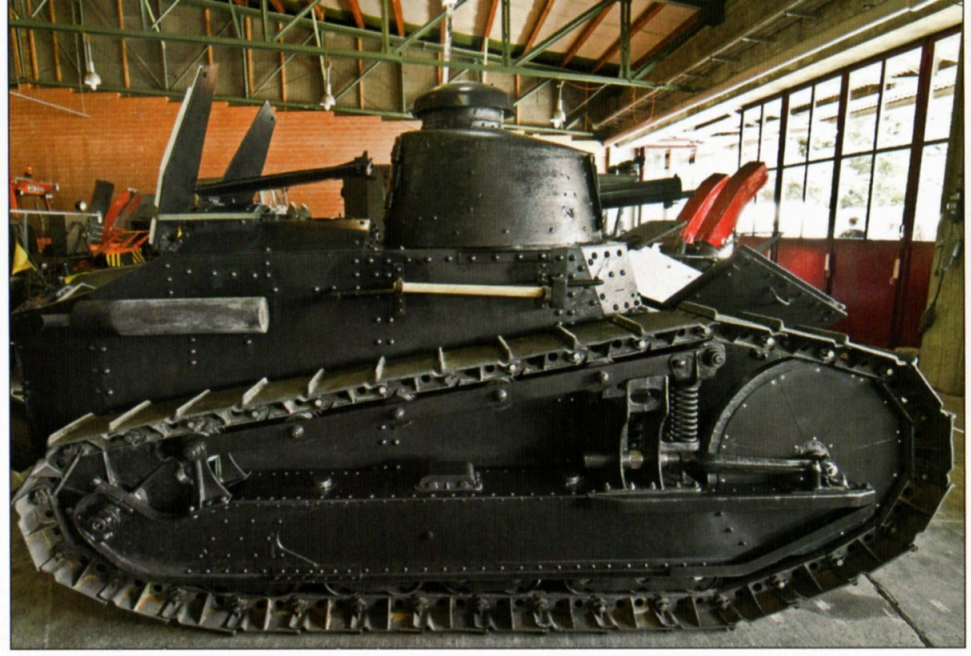


A close-up view is provided of the tow shackle and its retainer pin and chain. These pieces of hardware are of the correct type used on the FT-17 in World War I. To the far left is the starter fixture. A close-up view is also offered of the butt joints of armor plates at the rear of the hull as well as the track shoes. (Massimo Foti)



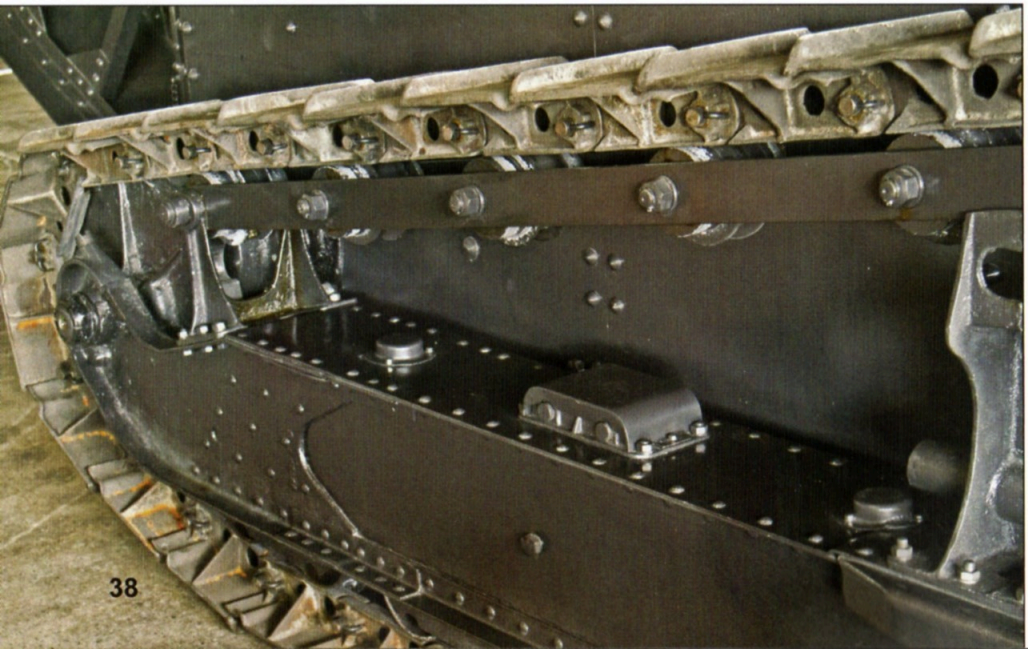


The running gear of the Thun FT-17 is in an excellent state of completeness. In the foreground, to the front of the right sprocket, is the pivoting bracket at the rear of the return-roller beam. The six return rollers are visible. With the exception of the front and rear rollers, the spindles of the rollers are secured by large hex nuts. (Massimo Foti)



Various features toward the rear of the right side of the Thun FT-17 are in view. The muffler has a distinctive discoloration pattern. Lacking any kind of a guard, the muffler was quite exposed to errant feet of crewmen and the various hard blows that were to be expected in active service. (Massimo Foti)

Details of the design of the leaf-spring support on top of the bogie beam toward the right are visible. The nuts that secure the spindles of the track return rollers in place are in turn secured by cotter pins that pass through the spindles; these are faintly visible in this photo. (Massimo Foti)



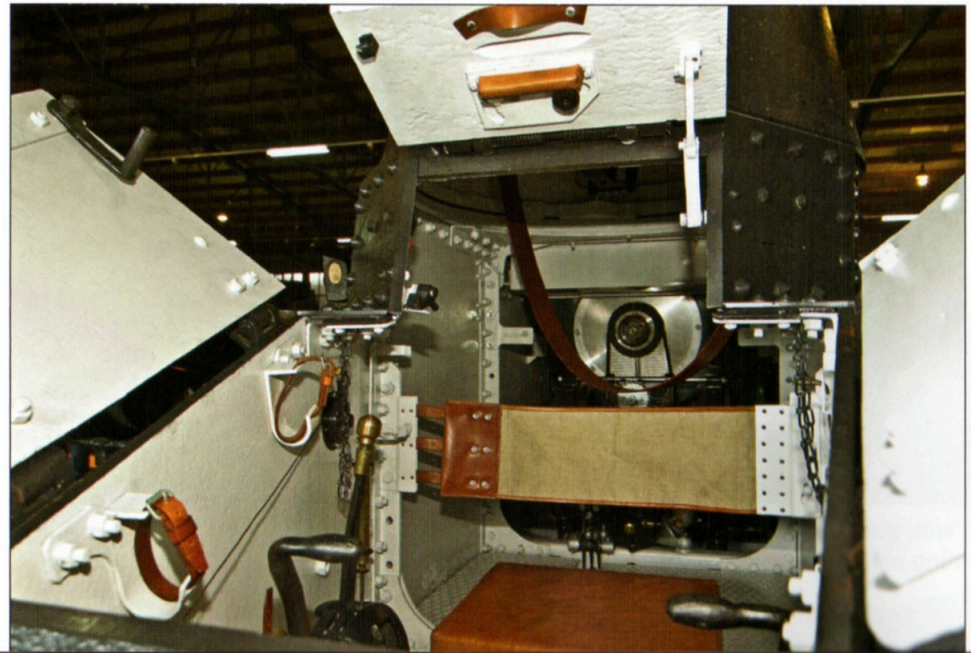
The radiator filler housing (left of center) is viewed from the right side of the FT-17. Immediately to its front (right in the photo) is the radiator air intake. Visible in profile on top of the deck to the right is the fuel filler cover. Hovering over the deck is the center cover of the engine compartment. (Massimo Foti)

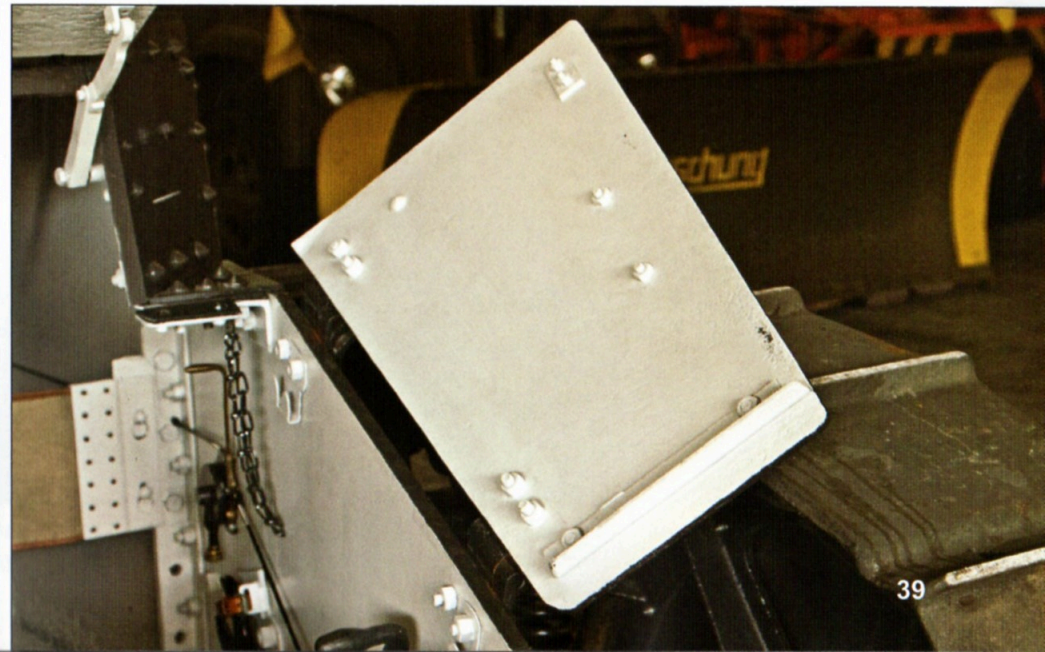
Two tool-stowage brackets are mounted on the right side of the hull. In this case, a sledgehammer and crowbar have been secured to the brackets with leather straps, the ends of which are neatly rolled up. Also visible is the piece of angle iron with a curved top attached to the hull below the lower edge of the turret. (Massimo Foti)

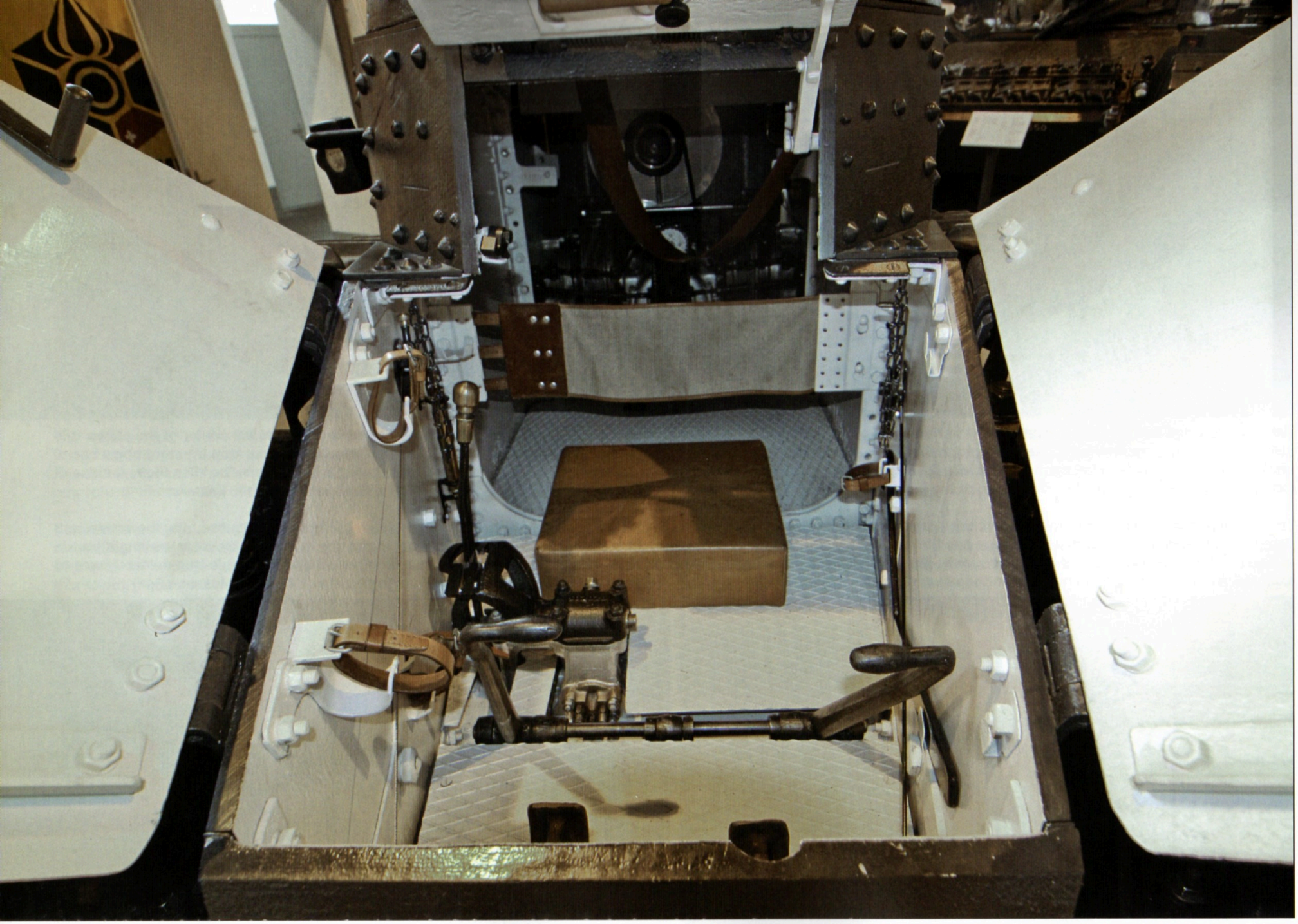
The driver's right step with its nonskid tread is shown at the center of the photo. It is attached to the side of the front of the hull. Above the step, atop the right bogie beam, details are visible of the idler bearing. Between the spokes in the idler, the rear sides of the metal plates attached to the outside of the idler are visible. (Massimo Foti)

The driver's front and upper doors are open, providing a view into the driver's compartment. A black latch with a crank-type handle is on the left door. Vintage photos of FT-17s show that the end of that latch opposite the handle was longer than on this example. A single, folding strut holds open the upper door. (Massimo Foti)

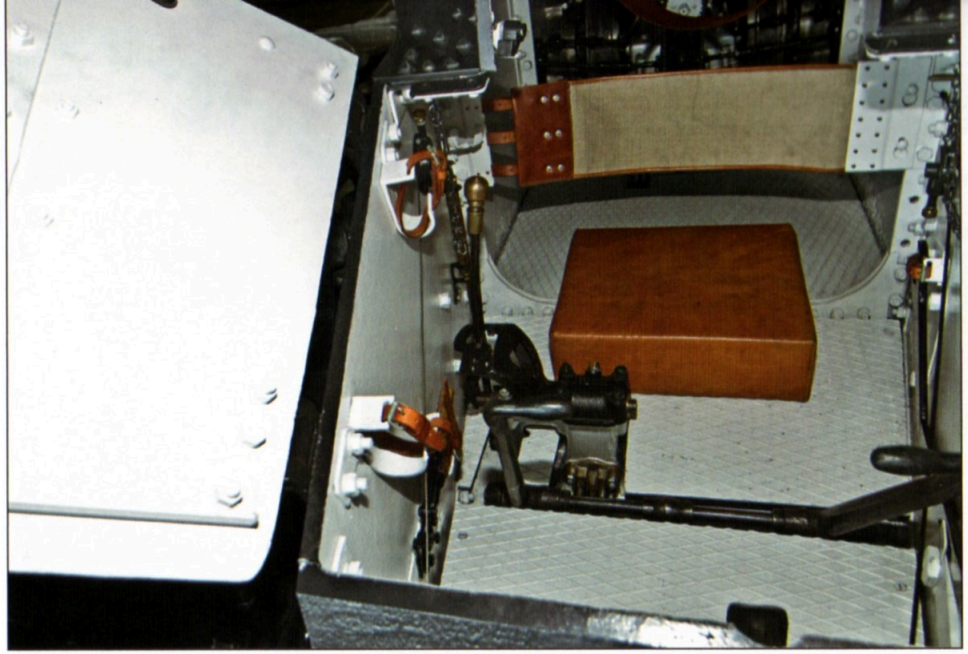
On the inside of the left lower driver's door are nuts and bolts securing the handle and the hinges on the exterior of the door. Toward the front of the door, an angle iron is attached with two bolts and hex nuts. The purpose of this angle iron evidently was to create a seal between the door and the front plate of the hull. (Massimo Foti)



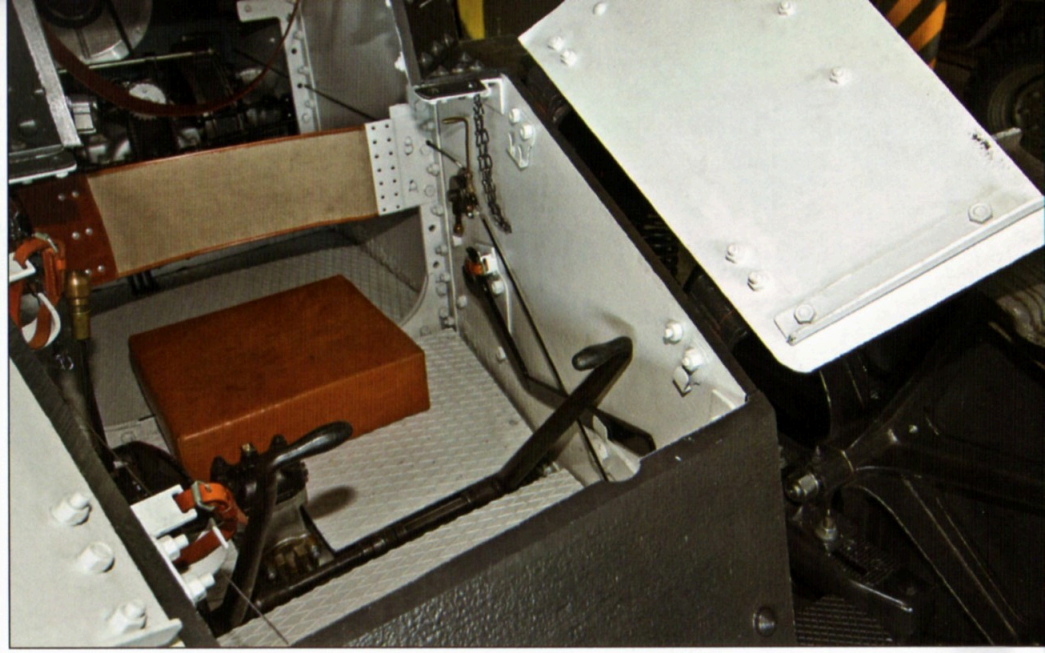




The layout of the driver's compartment is shown. The driver sat on a simple canvas seat, with the backrest consisting of a piece of canvas stretched across the hull above and to the rear of the seat. Behind the driver's compartment, there is a direct view into the fighting compartment and the engine compartment. (Massimo Foti)

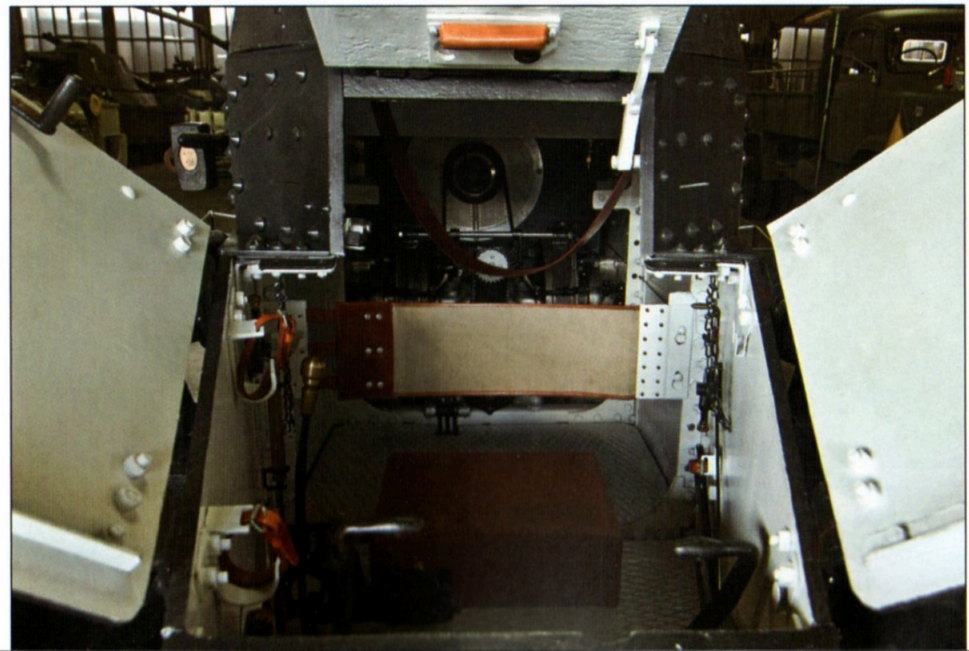


On the right side of the driver's compartment is the right steering clutch lever (left), shaped like an inverted L. Behind that lever are the gear shift lever with a brass handle and the shift gate. On the rear side of the shift gate, and not visible in this photograph, are the throttle and the spark lever. (Massimo Foti)

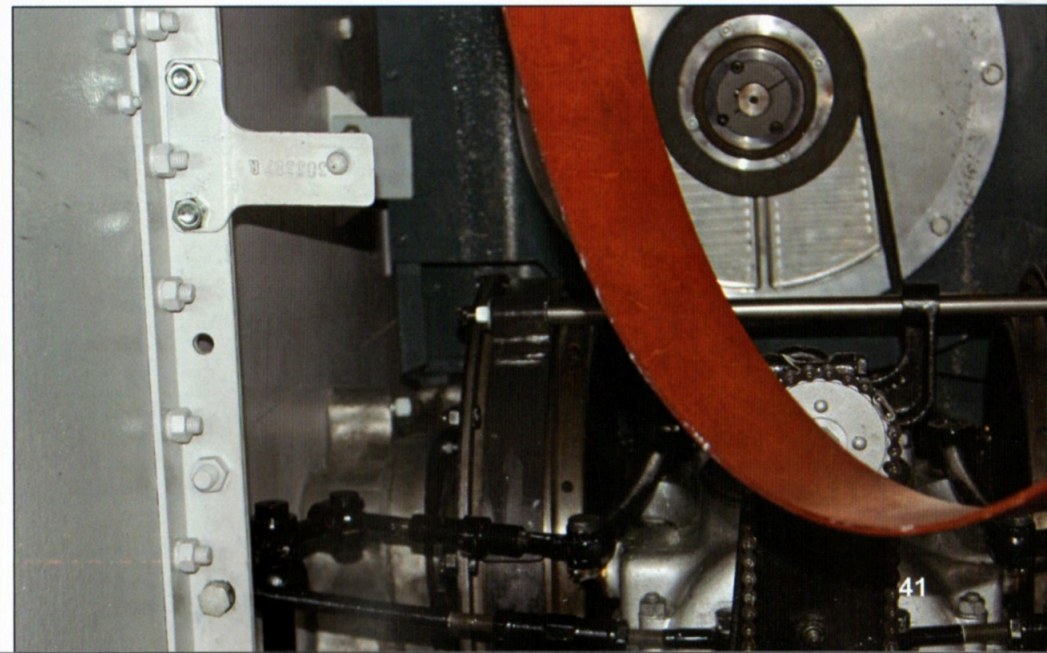


Facing the left side of the driver's compartment, the left steering clutch lever is at the center, with its linkage rod running across the floor. A large open-ended wrench with a bent handle, possibly for adjusting the idler wheels and track tension, rests in brackets on the side of the hull. The floor has a diamond tread pattern. (Massimo Foti)

The chains on either side of the driver's compartment could be attached to the steering levers to hold them all the way back, which acted in effect as a parking brake. On the driver's upper door (top) is a crash pad. The cigar-shaped indentation on the driver's door at the top of the photo is the bevelled inner edge of the vision slit. (Massimo Foti)

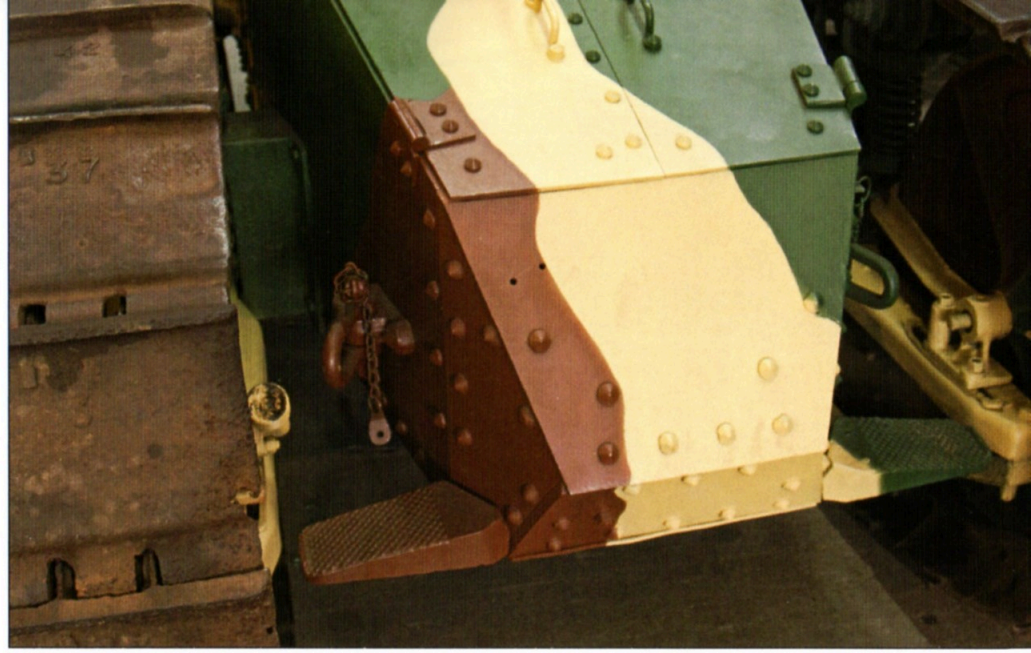


The Renault FT-17 lacked a firewall or bulkhead between the fighting compartment and the engine compartment. Thus, one can look directly from the driver's compartment into the front of the engine compartment and the transmission group. The leather strap running across the view served as the commander/gunner's seat. (Massimo Foti)



The Musée des Blindés de Saumur in France has several Renault FT17s in its collections. This is an FT-17 modifié 31, the official designation of a modification made to remaining stocks of the FT-17 in France in the early 1930s. The project commenced in 1931 and entailed the installation of the 7.5 mm Reibel machine gun in the turret. Unofficially, this version was sometimes referred to as the FT-31. This preserved example is painted in a three-color camouflage scheme of light yellow, green, and dark brown. (Massimo Foti)

For the FT-17 modifié 31, a redesigned mantlet was installed. It has an outer frame with an inner gun shield, both of which have offset apertures for the machine gun and the gun sight. The driver's upper door is missing from this vehicle. The turret is the Berliet type with cast-steel roof and forged sides. (Massimo Foti)



The driver's steps with nonskid treads are present on both sides of the nose of the hull. Tow shackles are installed on the brackets on the sides of the nose. A close-up view is provided of the different casting marks on the track shoes: from the top down, they are "42," "37" (with smaller numbers above that number), and "3." (Massimo Foti)

In the FT-17 at the The Musée des Blindés, a mannequin sits in the commander/gunner's perch in the turret hatch, the doors of which have been removed. A red diamond insignia is toward the rear of the hull. From this angle, the uniform gap below the center engine compartment cover is visible. (Massimo Foti)

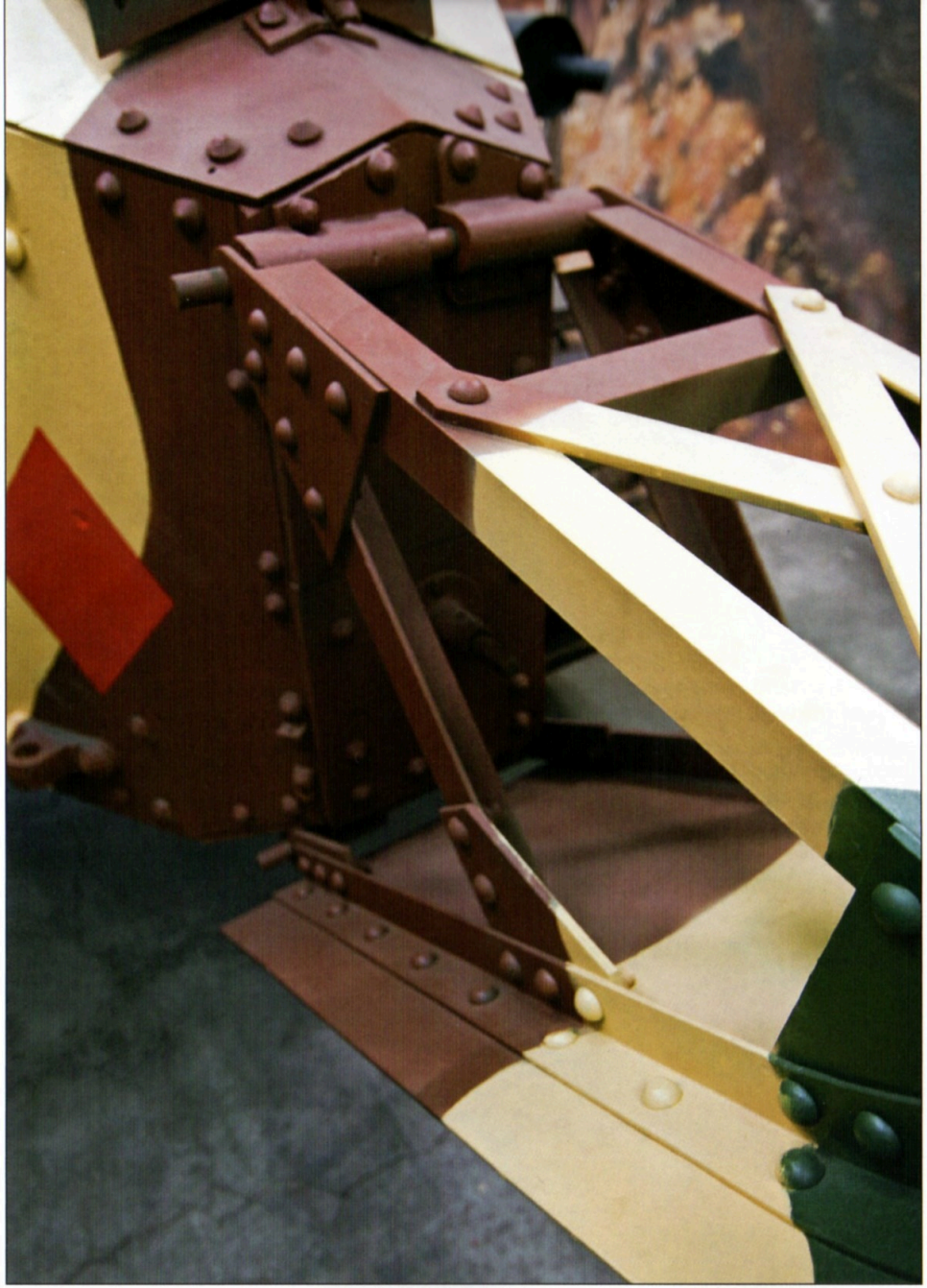
The side plate to the left of the driver's upper door is shown. A vision slit is toward the bottom of the plate. Toward the lower left of the photo, a door stop with an S-shaped profile is attached to the rear hinge of the driver's lower door. These stops on both lower doors hold them open at an angle of approximately 45 degrees. (Massimo Foti)

The focus here is on the rear of the hull and the left engine compartment cover. Tool brackets with loops for leather retainer straps are bolted to the engine compartment cover. On the side of the hull, the brackets for the tool box and the tow cable have been removed, but the holes for their bolts remain. (Massimo Foti)

The left coil-spring bracket of an FT-17 at the Musée des Blindés de Saumur is shown in detail. The lower end of the spring is seated in a cup-shaped extension of the bracket, while the top of the spring fits into a casting that supports the front end of the return-roller beam. On that casting is a part number in raised letters, 8710. (Massimo Foti)

Two leaf-type hinges are attached with conical-headed bolts to the front end of the left (shown here) and right engine compartment covers. The inner hinge of each of these doors is partially covered by the center cover, which is attached by a leaf hinge to the top of the radiator filler housing (upper center). (Massimo Foti)

The rear of the center cover of the engine compartment includes a spacer plate that holds the rear of the cover up. It allows ventilating air to pass through the gap between the right and left covers of the engine compartment. The toggle bolt to latch the center cover is present, but the latch bracket on the cover is missing. (Massimo Foti)



The frame of the tail of the FT-17 at the Musée des Blindés de Saumur is constructed of angle irons with steel-plate gussets attached with nuts and bolts. The metal skid is riveted to the frame, with the rivets on the underside of the skid being flush with the skid surface. Steel crossbars fastened to the top of the frame serve to stiffen it. (Massimo Foti)

This is one of the other FT-17s at the Musée des Blindés de Saumur, and it, too, is armed with the 7.5 mm Reibel machine gun in a redesigned mantlet and gun mount. This vehicle is equipped with the tool box, strapped to the brackets on the left side of the hull, as well as a coiled tow cable just behind the tool box. (Dennis Trowbridge)

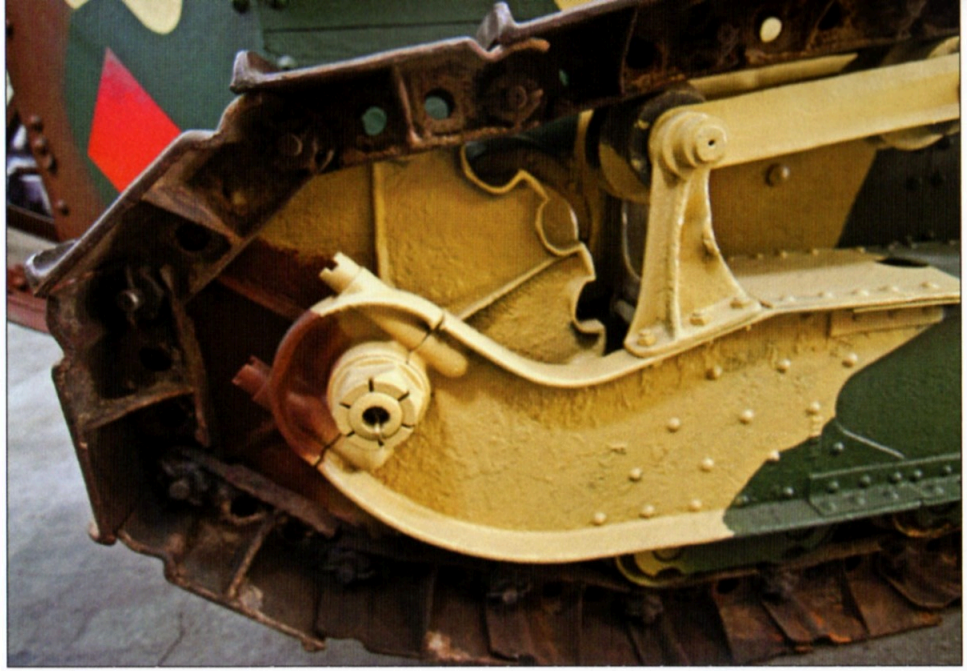
With a mannequin seated in the turret door of the FT-17 at Saumur, one can better judge the diminutive scale of the tank. (Massimo Foti)

On the insides of the gussets of the tail, the small hex nuts that secure the gussets to the frame are visible. (Massimo Foti)

To attach a hand crank to the starter fixture on the rear plate of the hull, it was necessary to lower the trail. (Massimo Foti)

The muffler and tail pipe are of a dark, heat-discolored metallic tint. The muffler exhibits the usual dents. (Massimo Foti)

The right hinge of the right engine compartment cover is shown in detail. Several shapes and sizes of conical bolt heads are present. (Massimo Foti)

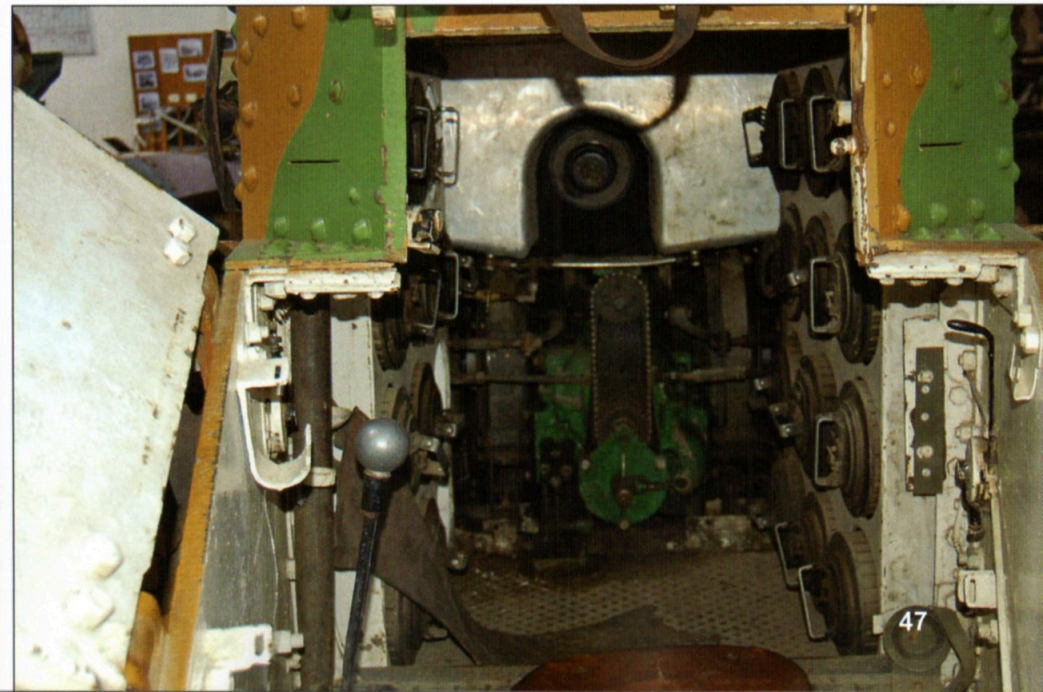


Details of the construction of the rear of the bogie beam, the sprocket bearing, and the pivot bracket of the return-roller beam are evident. (Massimo Foti)

The side of the bogie beam was fabricated from several overlapping sections of steel girders, joined together with rivets and angle irons. (Massimo Foti)

The FT-17 driver's doors are open at the Musée des Blindés de Saumur. A leather handle is visible on the right and left lower doors. This tank wears a well-worn camouflage scheme of dark yellow, light brown, and light green. Note how the paint has been scuffed off down to bare metal on the driver's steps and the armor plates. (Dennis Trowbridge)

Looking into the driver's compartment, there is a straight view to the transmission group to the rear of the fighting compartment. On racks on both sides of the fighting compartment are 150-round drum magazines for the Reibel machine gun. Each magazine has a handle. The driver's seat is at the very bottom of the photo. (Dennis Trowbridge)



In common with other Girod turrets, this one has a noticeable seam where the roof meets the sides of the turret, and it has a light texture on the sides but a smooth finish around the base of the turret. In raised letters on the side of the turret is a casting mark, "GV." The shape of the side of the machine gun mount is also in view. (Massimo Foti)

A close-up view shows the design of the Reibel machine gun mount, gun shield, and mantlet. The exposed portion of the Reibel mount is an armored cradle with a large opening in the bottom, presumably to drain any water that falls into the cradle. The gun sight extension contains a small peephole. (Massimo Foti)

The Reibel 7.5mm machine gun, designated by the French as mitrailleuse mle. 1931 (machine gun, model 1931), was used in various French tanks in the decade preceding World War II. The muzzle end of the gun protruding from the cradle has a conical flash suppressor with several sizes of perforations. (Massimo Foti)

The Reibel machine gun and cradle are viewed from the right side. Note the flat area on the barrel to the rear of the flash suppressor, designed to accept an open-ended wrench for unscrewing the flash suppressor from the barrel. Also visible is a joint between two plates of the roof of the hull, to the front of the turret.

This late-production Renault FT-17 resides at the Koninklijk Museum van het Leger en de Krijgsgeschiedenis (Royal Museum of the Armed Forces and of Military History) in Brussels, Belgium. The museum acquired the tank in an exchange with the Musée des Blindés de Saumur in the early 1990s. The tank features a Berliet turret with a 37mm Puteaux gun. Despite its scuffed, weathered appearance, the three-tone camouflage paint job is fairly recent. (Massimo Foti)

The left and center engine compartment covers are shown close-up. At the far right is the latch for the center cover, and at the lower left are the tool box brackets. (Massimo Foti)

A casting mark, "PF," is visible toward the rear of the bogie beam. Small casting marks are also visible on the two bolt housings on the sprocket-bearing retainer. (Massimo Foti)

There is no vision slit cover on the left door of the turret, so the beveled interior edges of the vision slit are visible. There is no interior handle on the door. (Massimo Foti)

There is an extra stowage bracket, purpose unknown, on the hull next to the turret. The small square plate with two bolts is the remnant of a broken bracket. (Massimo Foti)

The maker's mark, "P GIROD / UGINE" is cast in raised block letters on the left side of the turret. Note the vision slit on the plate below the maker's mark. (Massimo Foti)

The barrel of the Puteaux 37mm gun barrel is housed in a jacket, the lower edges of which are bolted to the recoil cylinder. Next to the barrel is the sight tube. (Massimo Foti)

Within the hole on the bottom of the gun shield is the lower lateral trunnion, which, along with the upper lateral trunnion, allows the gun to pivot side to side. (Massimo Foti)

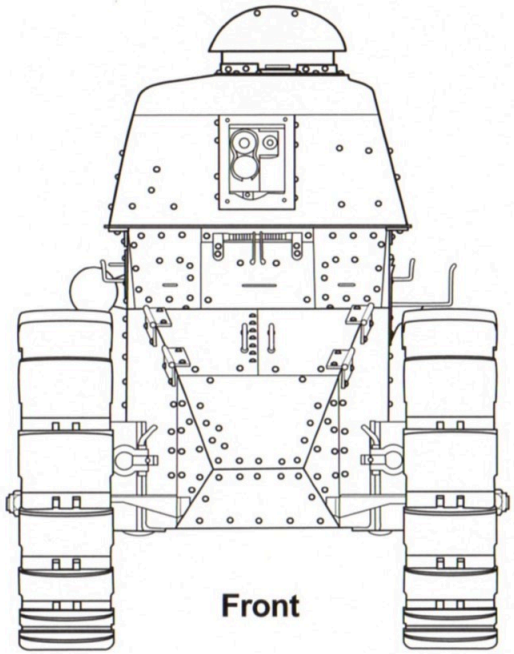
The gun mount and shield includes the hole for the lower lateral trunnion as viewed from the other side. A vision slit is at the bottom front of the cupola. (Massimo Foti)

A small bracket is above and to the rear of the driver's side vision slit. To the rear are brackets for pioneer tools. A casting mark, "V8," is on the turret. (Massimo Foti)

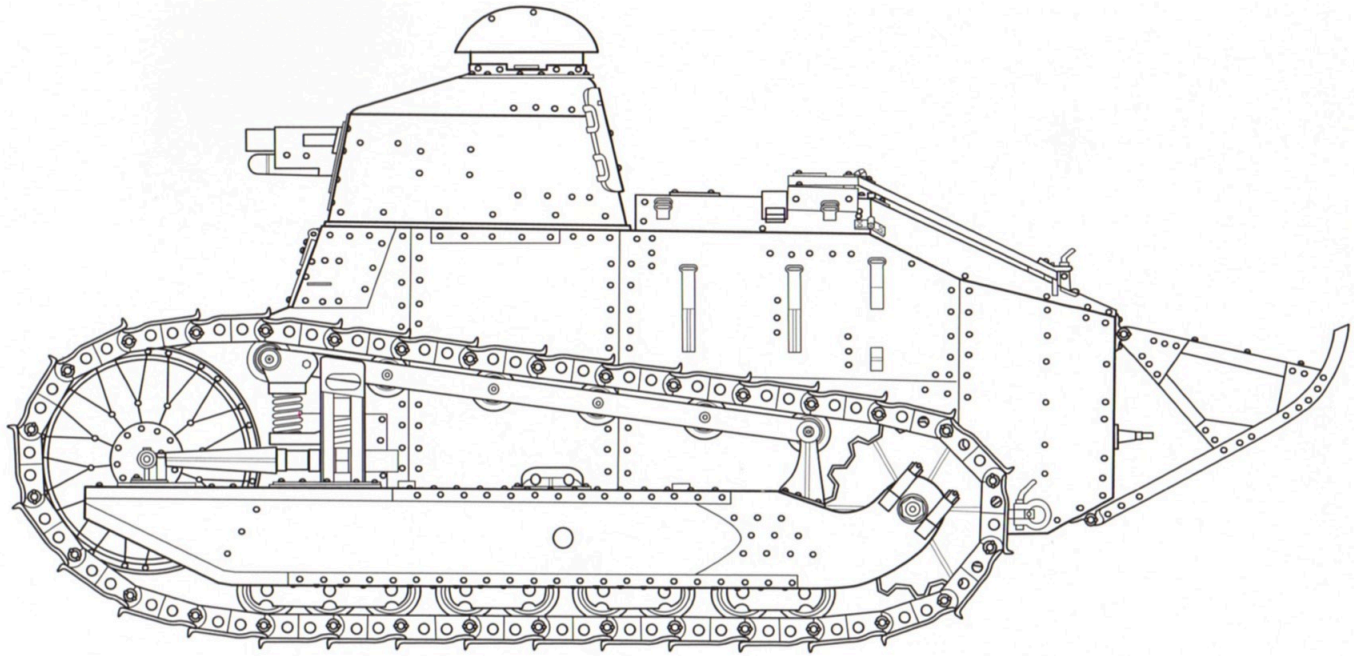
The track shoes in view here are apparently devoid of casting marks. The surfaces of the tracks are somewhat pitted and rough in texture and lightly rusted. (Massimo Foti)

The tool brackets on the right side of the hull include an upper and lower piece, each of which includes a loop for a leather retainer strap. (Massimo Foti)

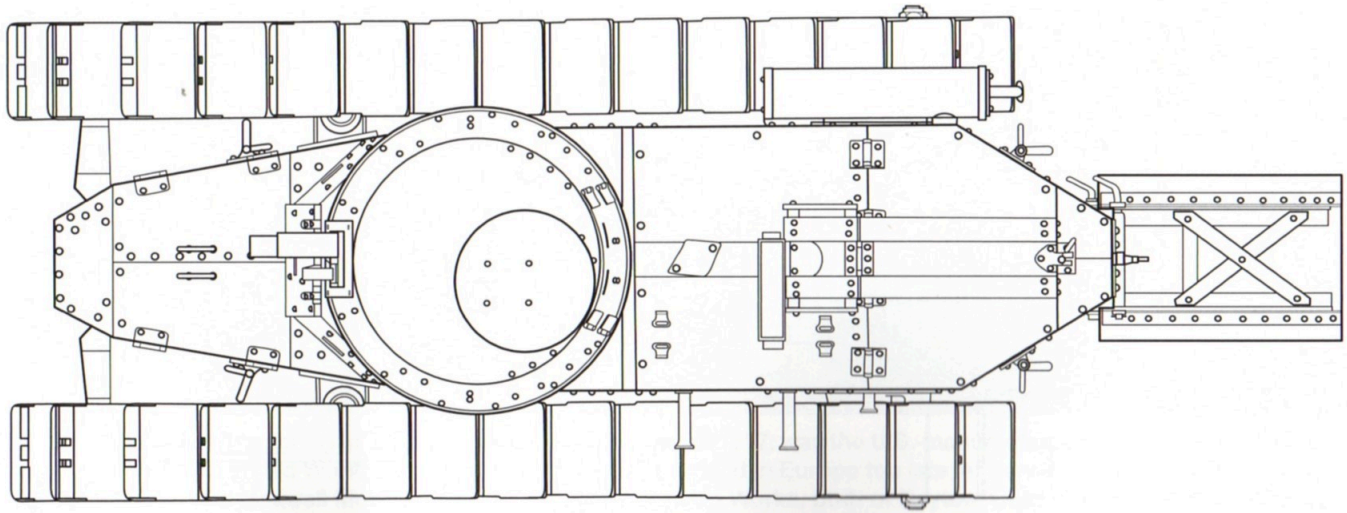
FT-17



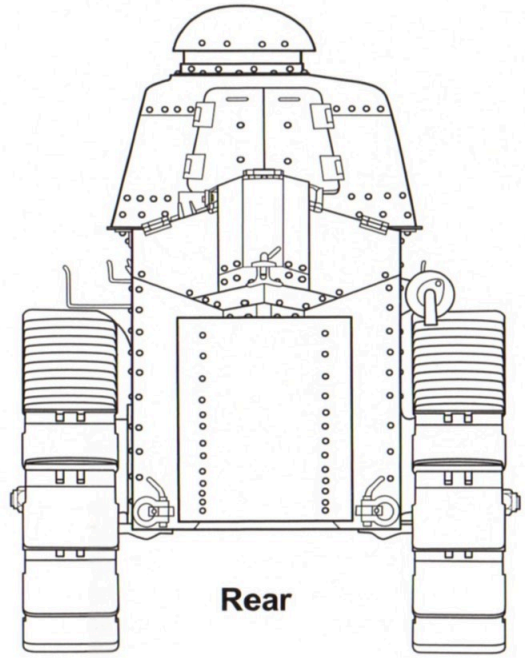
Front



Side

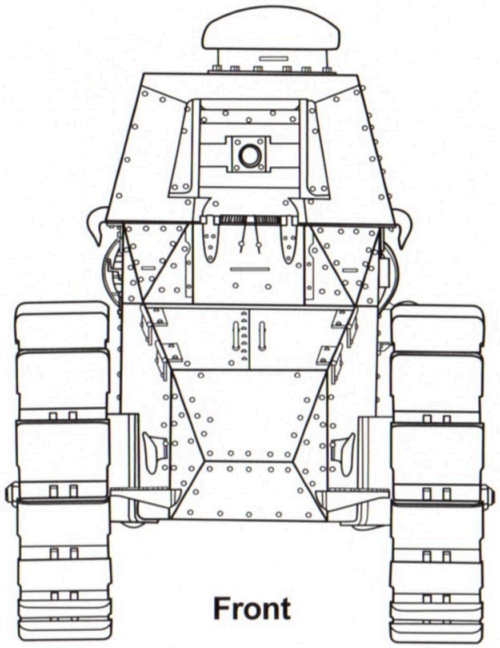


Top

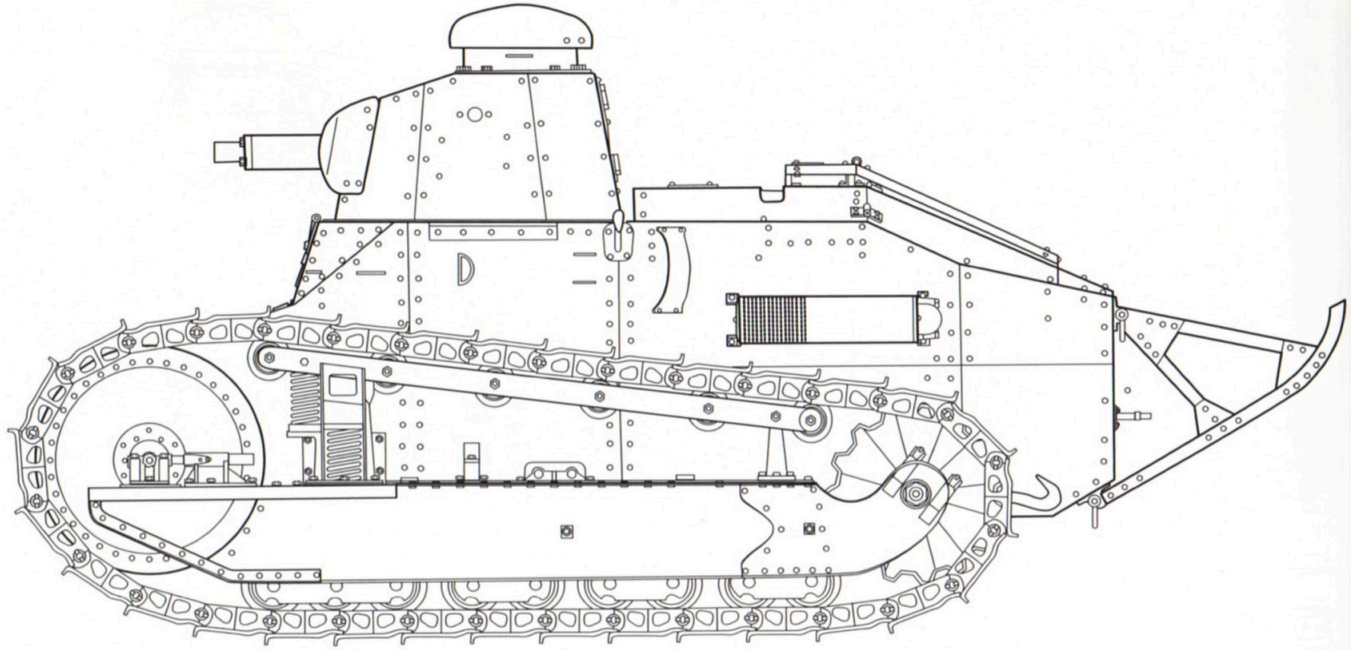


Rear

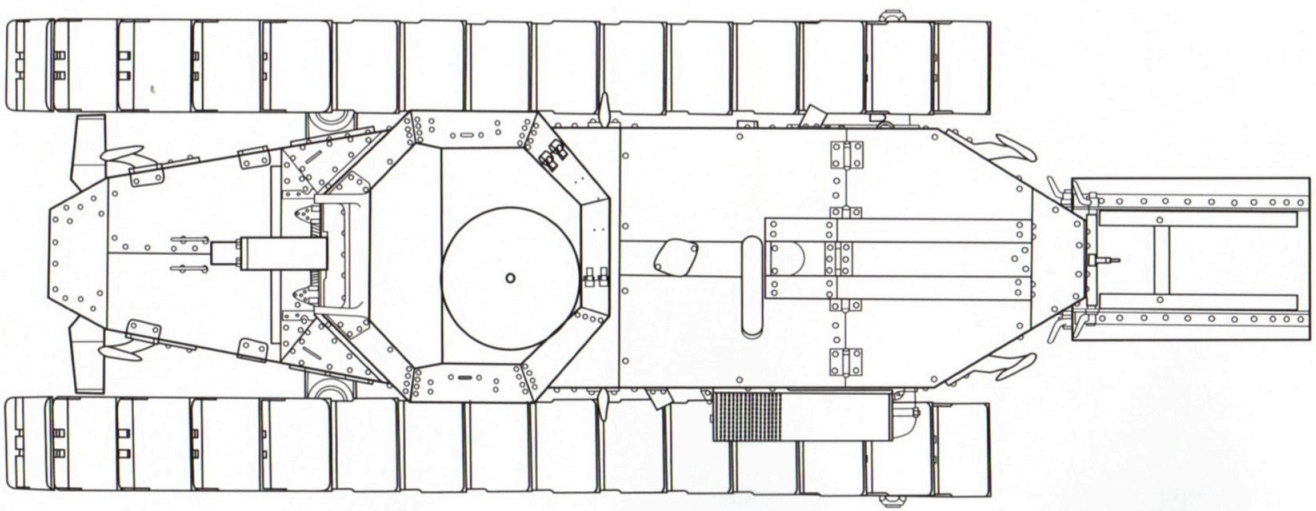
M1917



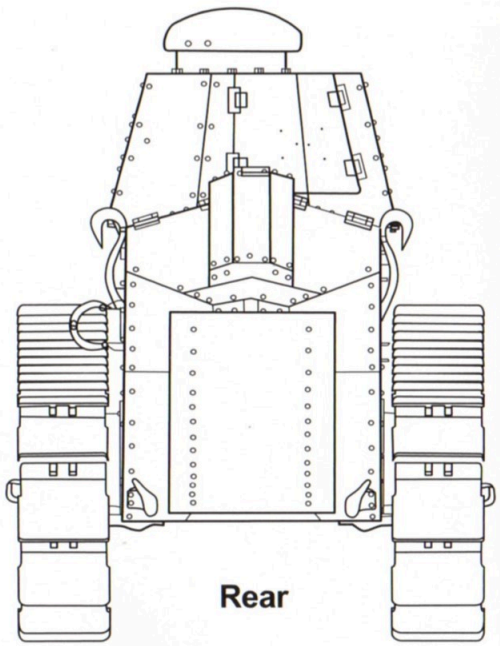
Front



Side



Top



Rear

M1917

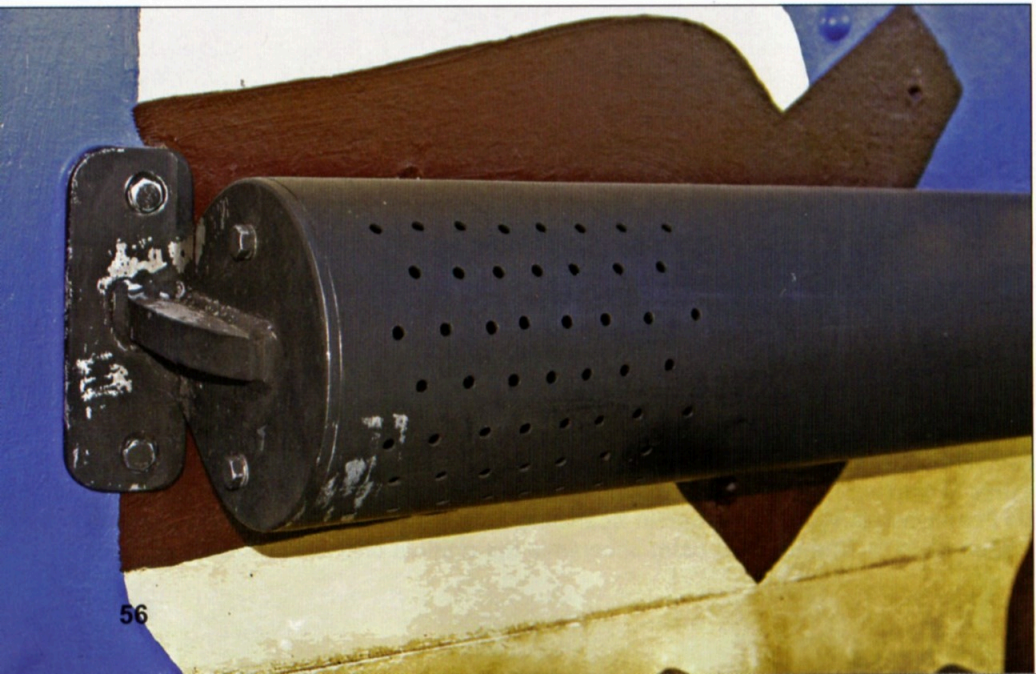
The Six-Ton Special Tractor M1917, later called the Six-Ton Tank M1917, was the U.S.-manufactured version of the Renault FT-17. Production of the M1917 commenced one month before the Armistice ended World War I, and the first M1917s arrived in Europe too late for service in the war. The M1917 was built at three factories: C. L. Best Tractor Company, Cleveland, Ohio; and Maxwell Motor Company and Van Dorn Iron Works, both of Dayton, Ohio. A total of 952 M1917s were built, including two pilot vehicles, 526 vehicles with the 37mm gun, 374 with machine guns, and 50 signal tanks lacking guns. This M1917 at the Pennsylvania Military Museum in Boalsburg is an early version armed with a Marlin .30-caliber tank machine gun. Tracks with the AMSCO maker's mark were commonly used on M1917s. The unusual paint scheme is the original one, discovered during the conservation of this historic piece.

The M1917 eliminated the FT-17's Y-shaped idler yoke in favor of a simplified idler-adjustment mount with a new screw bracket directly to the rear of the idler bearing. Also new for the M1917 was a redesigned muffler located on the left side. (B.R. Howard and Associates)

Whereas the FT-17 had a one-piece oblique armor plate on each side of the driver's upper door, the M1917 had a redesigned, three-piece armor construction in that area, made from triangular plates. Two of the plates on each side have vision slits.

The muffler of the M1917 has its inlet to the rear, and exhaust gasses exit from the holes toward the front of the muffler. The front cap of the muffler has a welded-on bracket that it bolted to the side of the hull. (B.R. Howard and Associates)

At the rear of the muffler is an elbow that conducts exhaust gas from the engine into the muffler. To the front of the muffler is a shovel bracket, above which is the left-hand lifting hook. These hooks were a feature of the M1917 not present on the FT-17. (B.R. Howard and Associates)



Protruding rivet heads on the underside of the skid of the tail seem to have been a characteristic of the M1917, whereas some Renault FT-17s featured flush riveting on the bottoms of the skids. Note that the skid is composed of two plates. (B.R. Howard and Associates)

Prior to conservation, the M1917 had wooden blocks bolted to the track shoes. In this overhead view, the Marlin .30-caliber machine gun housing and semi-cylindrical mantlet are clear. The yellow and blue camouflage includes black borders between the colors. (B.R. Howard and Associates)

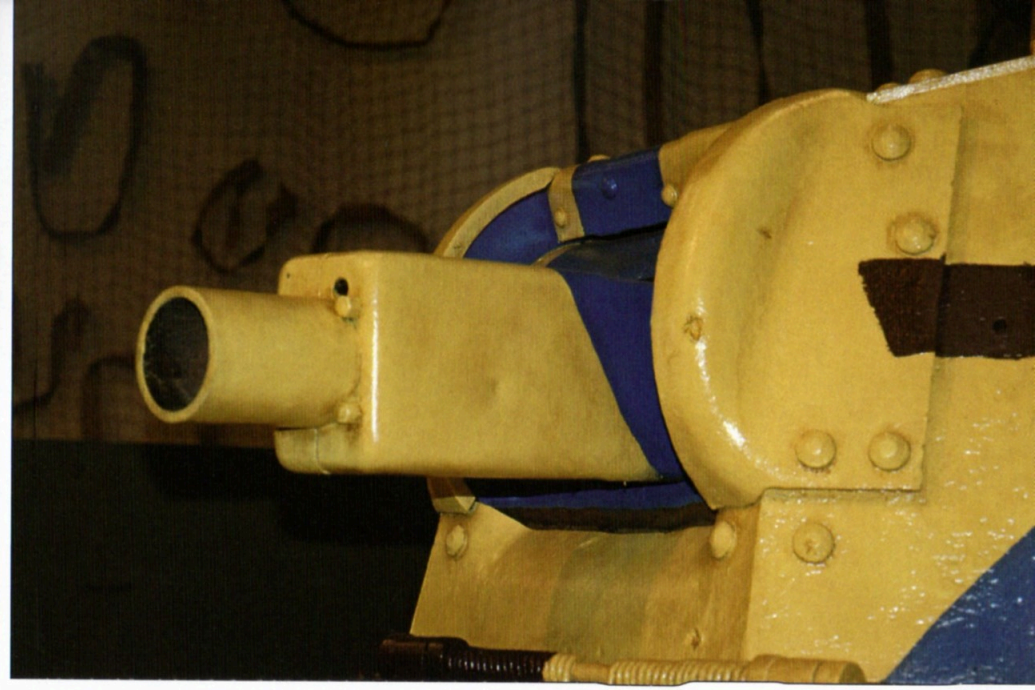
Three triangular plates are to the side of the driver's upper door. Note how the bottom of the gun mount bolted to the front of the turret extends not quite to the bottom of the opening for the gun in the turret. (B.R. Howard and Associates)

On top of the rear deck is the radiator filler housing, with the open sides characteristic of the M1917. Details of the lifting hook, pioneer tool brackets, and the sides of the tracks are also in view. The open right door of the turret is at top right. (B.R. Howard and Associates)

A shovel and pickaxe are shown secured to brackets on the right side of the M1917. Several of the tool brackets have integral loops for the leather retainer straps, but several footman loops for retainer straps are also present on the hull. (B.R. Howard and Associates)

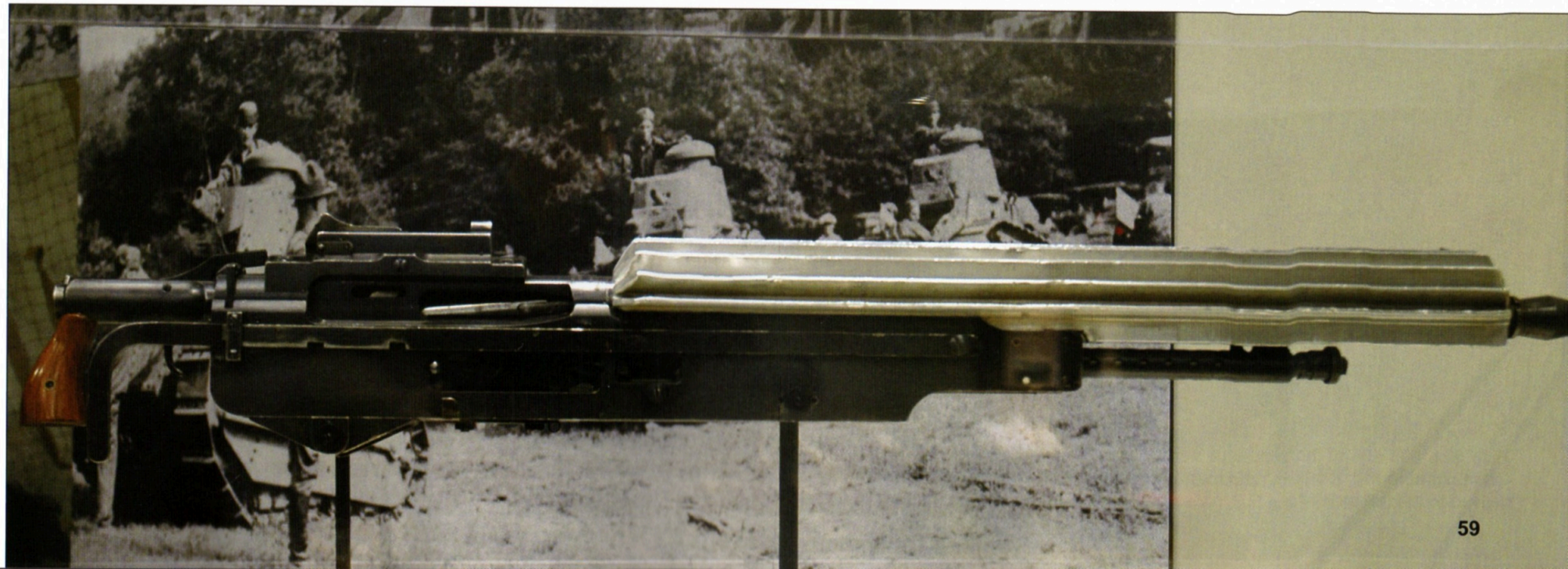
A small, round pistol port with an internal cover is on each side of the turret. The bolts with hex nuts on the sides of the port serve respectively as a pivot for the cover and a stop for it. The angle iron below the side of the turret is a holdover from the FT-17.

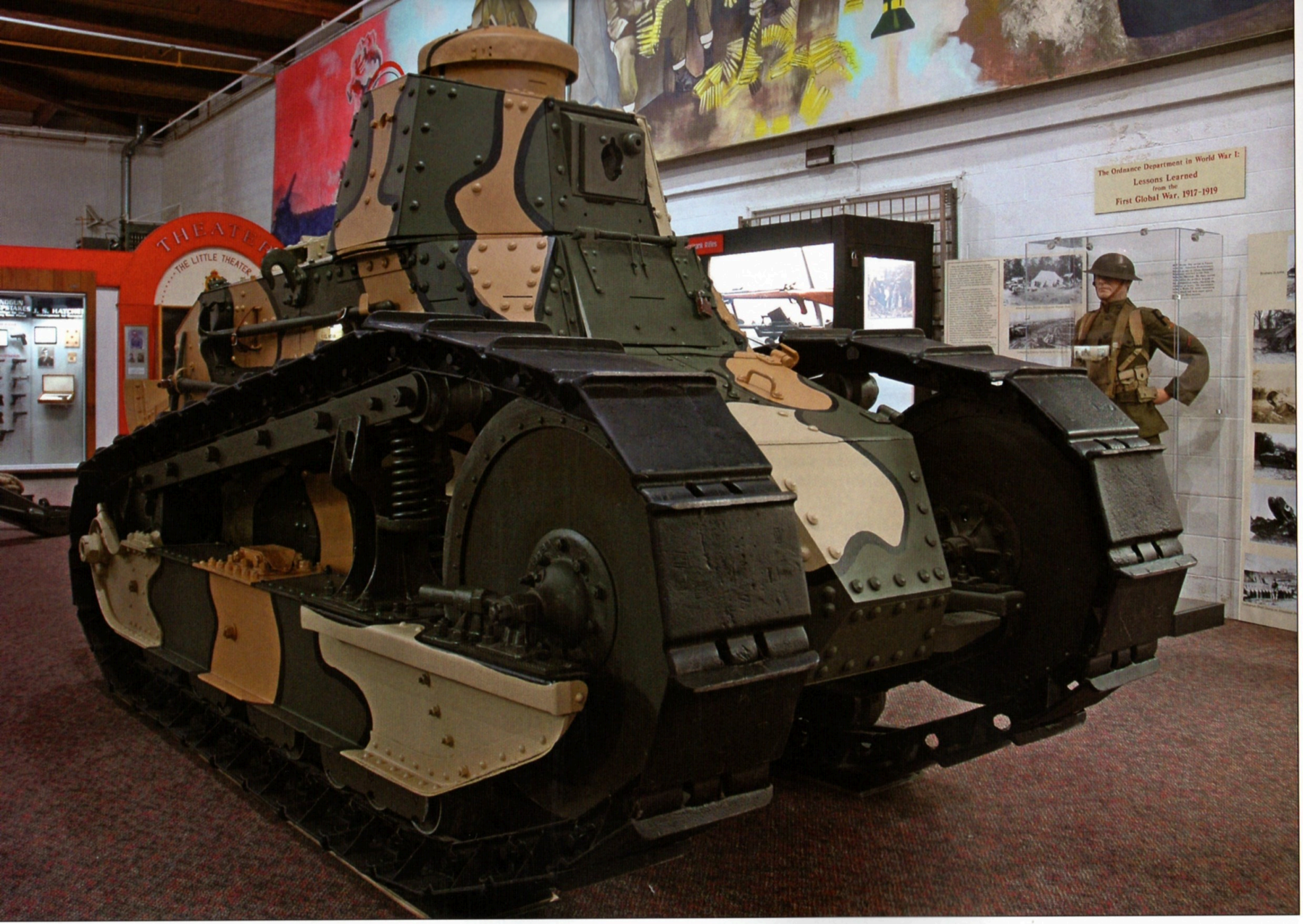
The housing for the Marlin .30-caliber tank machine gun is shown close-up. The square part of the housing is a two-part assembly, the seam of which is visible at the front of the square part of the housing.



External details of the gun mount and the left side of the Marlin machine gun housing are visible. The face-hardened steel armor plates of the turret of the M1917 six-ton tank are 6/10" thick, and the turret can be traversed 360 degrees.

The Marlin .30-caliber tank machine gun was a gas-operated, air-cooled weapon with a rate of fire approaching 650 rounds per minute. Beginning in September 1919, the Browning .30-caliber tank machine gun M1919 would supplant the Marlin in the M1917.





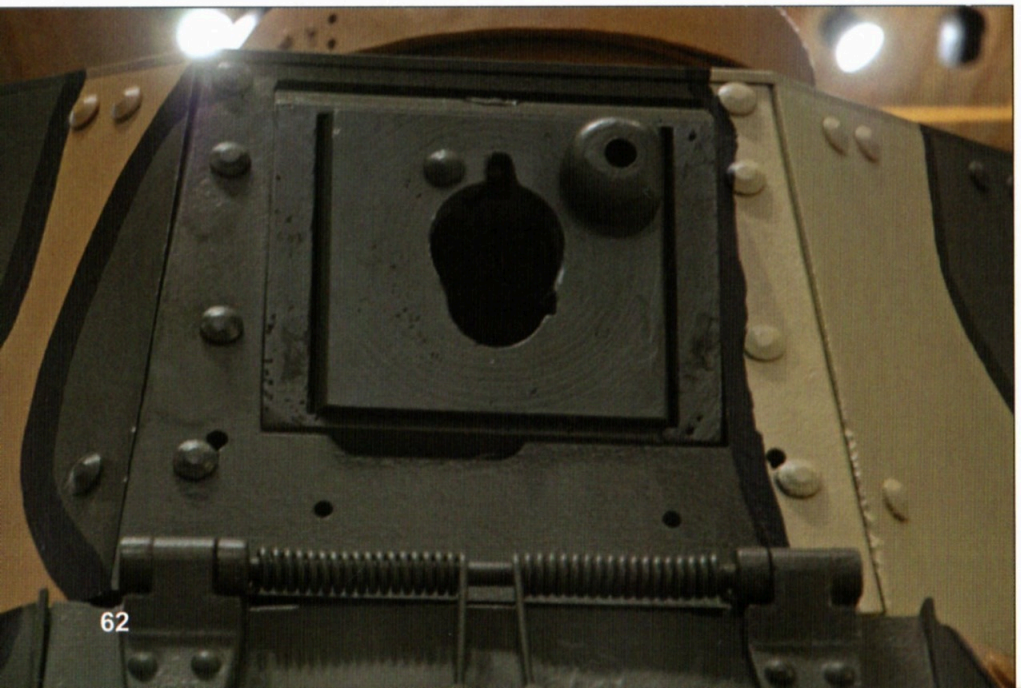
This tank was one of the prototype vehicles of the M1917 series. For decades it was part of the Smithsonian Institution's collections, and in the 1980s it was transferred to the USMC Air-Ground Museum, and then to the U.S. Army Ordnance Museum. This vehicle exhibits some of the distinctive features of the M1917, such as all-steel idlers, muffler moved to the left side of the hull, redesigned armor plates to the sides of the driver's upper door, and two driver's side vision slits instead of one on each side of the tank.

The M1917 varied from the FT-17 in several details. The tail of the M1917 lacked cross bracing on top of the frame, and it had tow hooks instead of tow shackles. In addition, lifting hooks were bolted to the side of the hull at the vehicle's center of gravity.

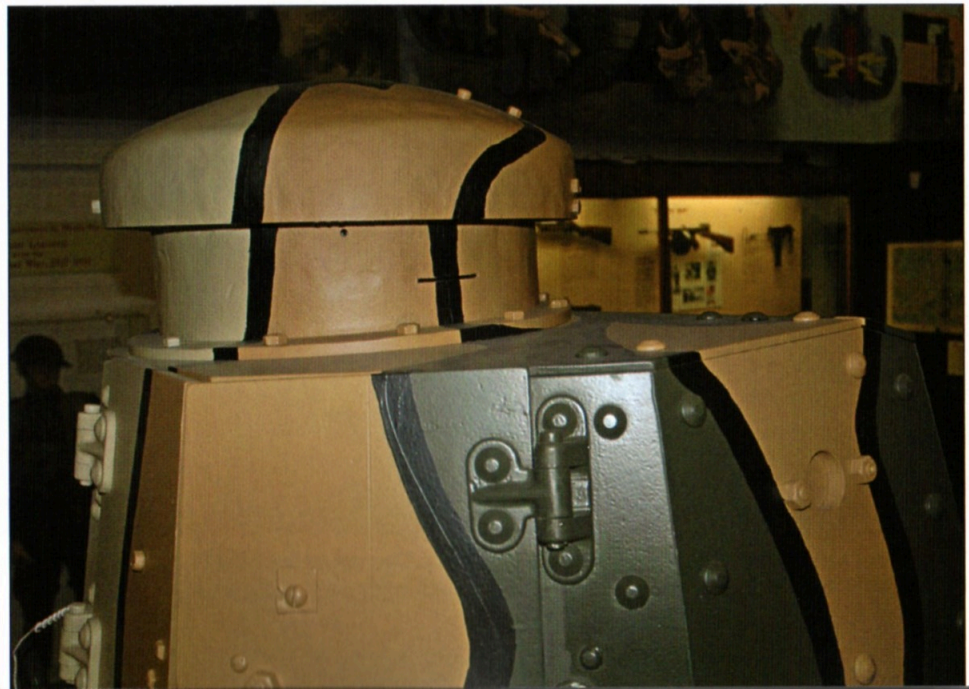
The M1917s had octagonal turrets fabricated from armor plates fastened to an interior frame. The left turret door is mounted on the rear plate of the turret. The door hinges are distinctive. A small pistol port is cut into each side plate of the turret.

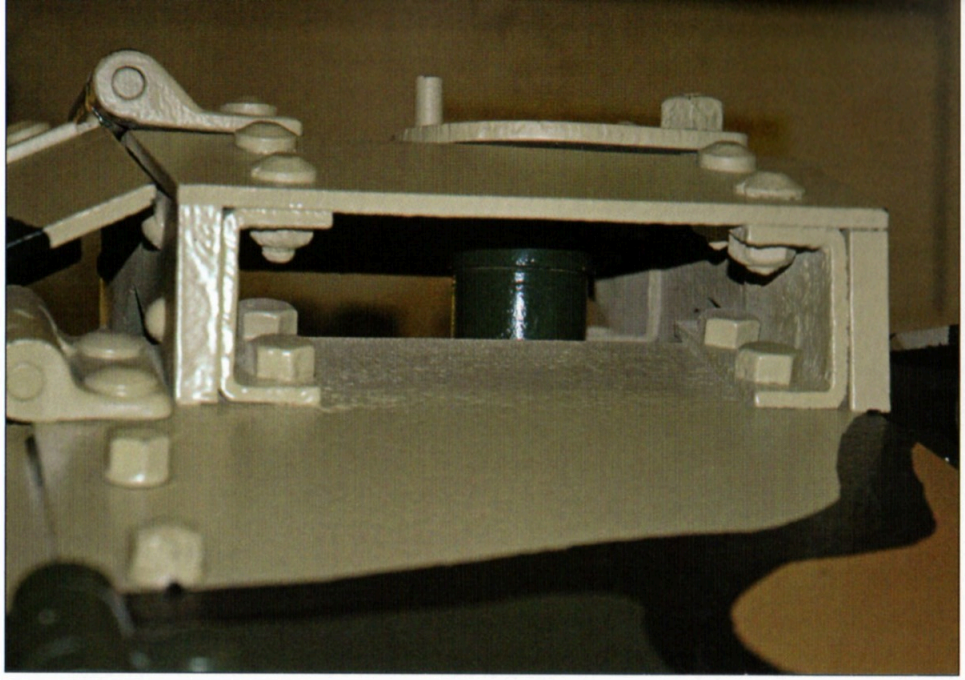
The cupola of the M1917 has an integral mounting flange around its base, unlike the L-profile flange of the Renault FT-17 that was bolted to both the cupola and the turret roof. The vision slits on the M1917's cupola are higher than those on the FT-17 cupola.

This prototype M1917 featured a flat gun mantlet of the type used with the Hotchkiss machine gun on the Renault FT-17. Production M1917s would feature different mantlets of semi-cylindrical and ball shapes.

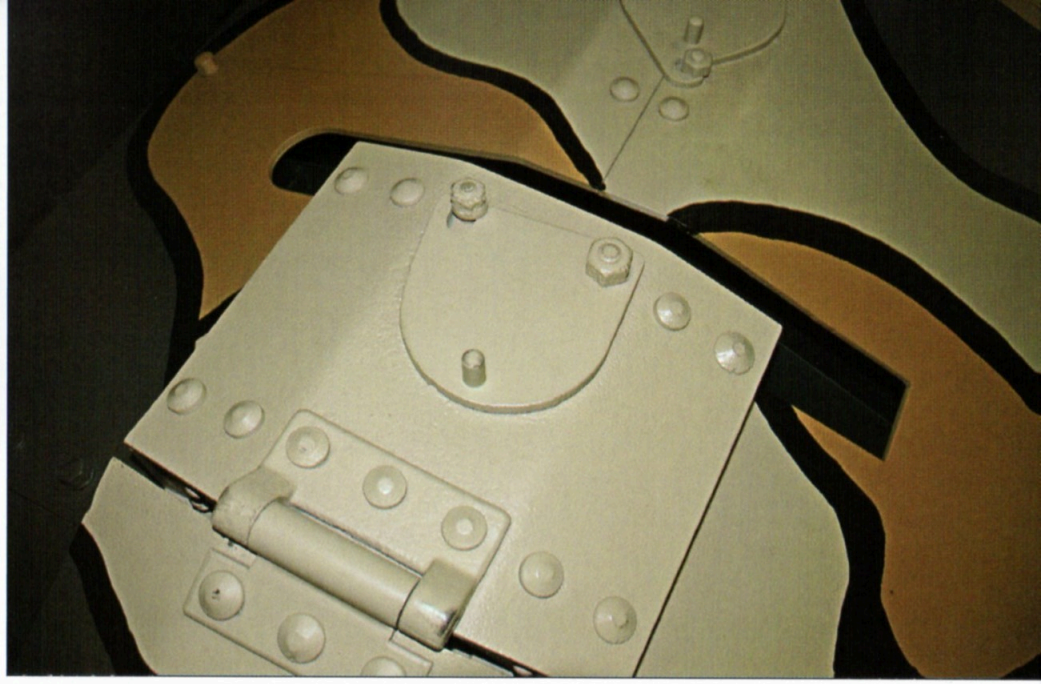


The upper half of the turret's right door is shown. The hinges are more sophisticated in design than the plain-looking ones of the Renault FT-17. Unlike the FT-17, the M1917 lacked vision slits in the two turret doors.



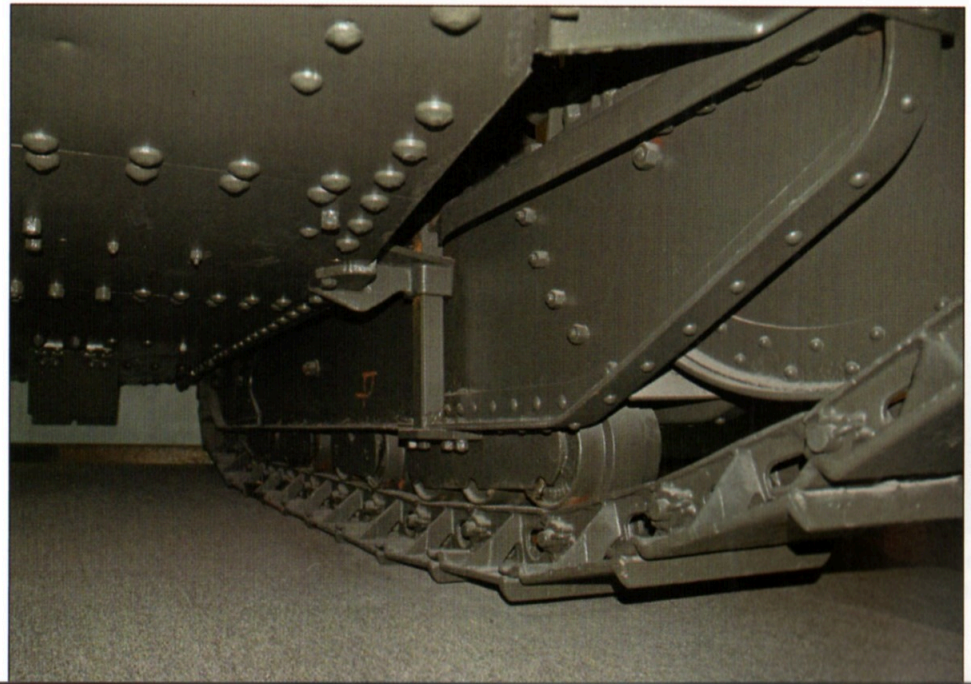


The M1917 dispensed with the armor side plates on the radiator filler housing, thus exposing the filler tube to view. On top of the housing is the pivoting cover plate for the filler, while to the left is the hinge for the center cover of the engine compartment.

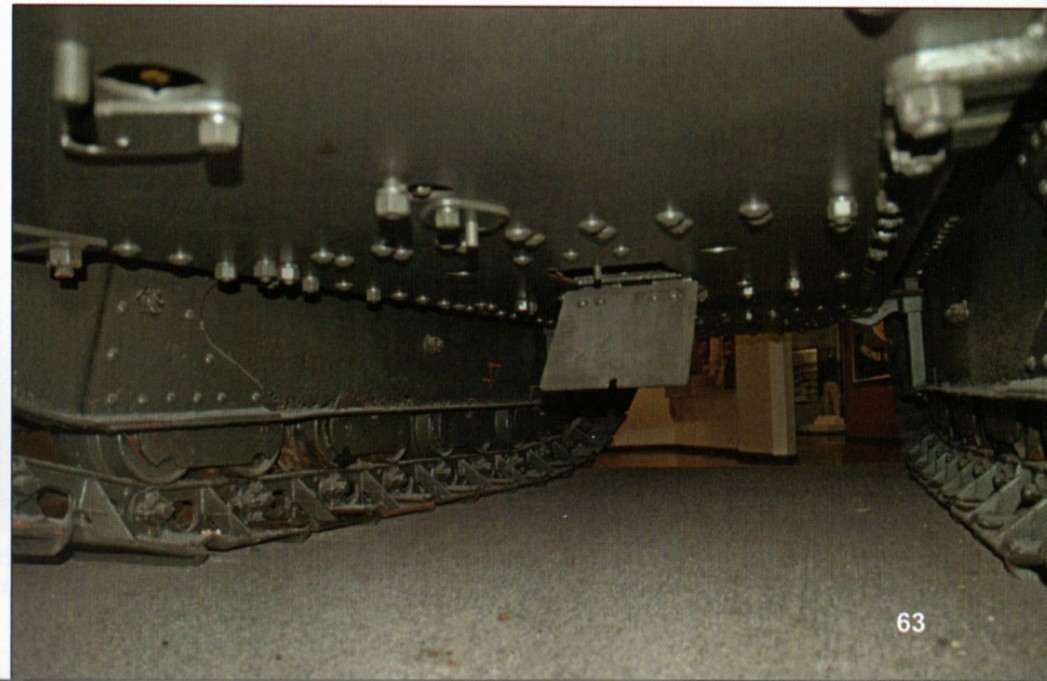


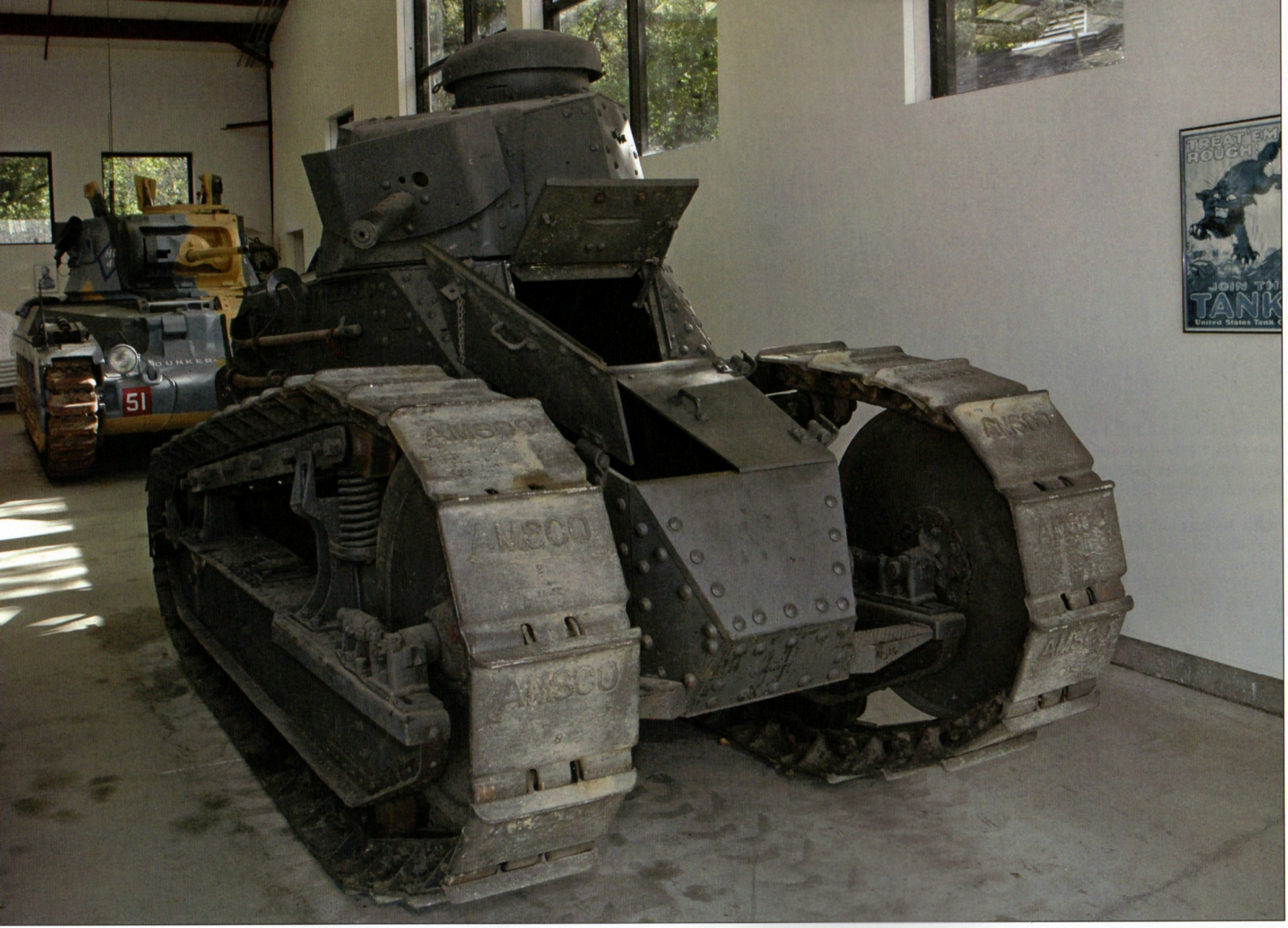
The radiator housing is viewed from above, with the front of the tank to the top of the photo. The D-shaped cover for the radiator filler pivots on the bolt and nut to the right. The bolt/nut to the left acts as a stop, and a rod at the rear of the cover is the handle.

The inner faces of the right bogies are in view, as is the plate attached to the bottom of the bogie arm, to which the bottom of the strut of the coil spring is fastened. Toward the rear of the hull the access door hangs open from two leaf-type hinges.



The underside of the M1917 from the rear of the tank presents a clean appearance. An access door with two large hinges is at the center. The struts of the hull suspension springs are bolted to each side of the bogie beam toward the front of the tank.





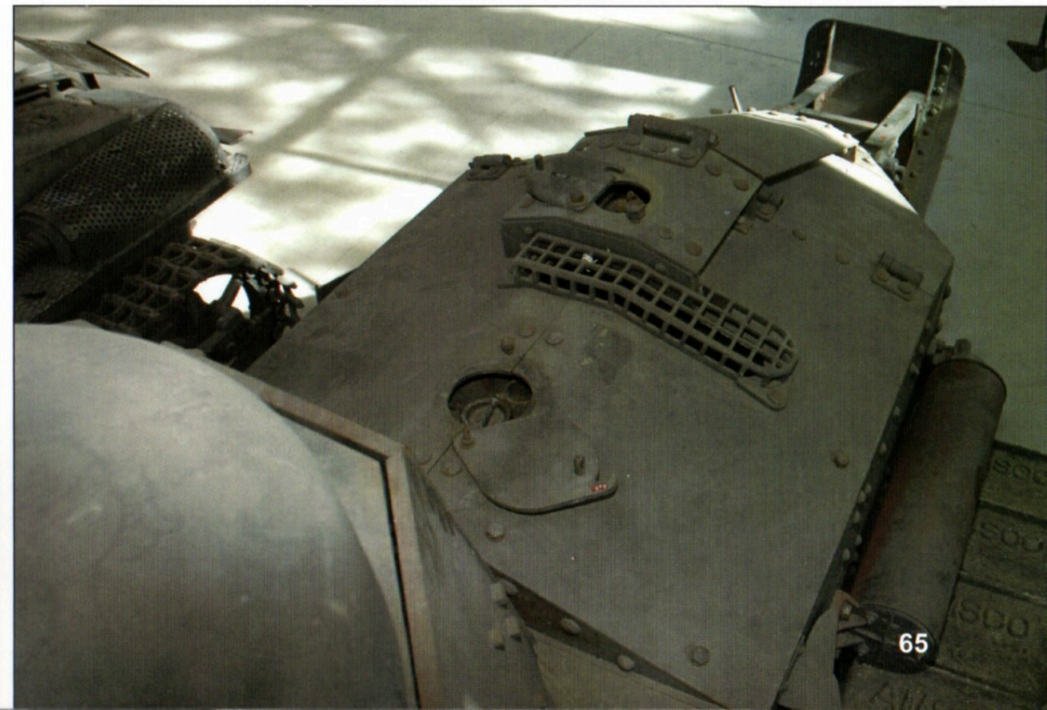
This M1917 in the collection of the Military Vehicle Technology Foundation is armed with a Browning M1919 .30-caliber machine gun. The barrel of the machine gun was housed in a protective cylinder, and a steel shield was installed over the barrel to supplement the armor protection the mantlet offered. (Chris Hughes)

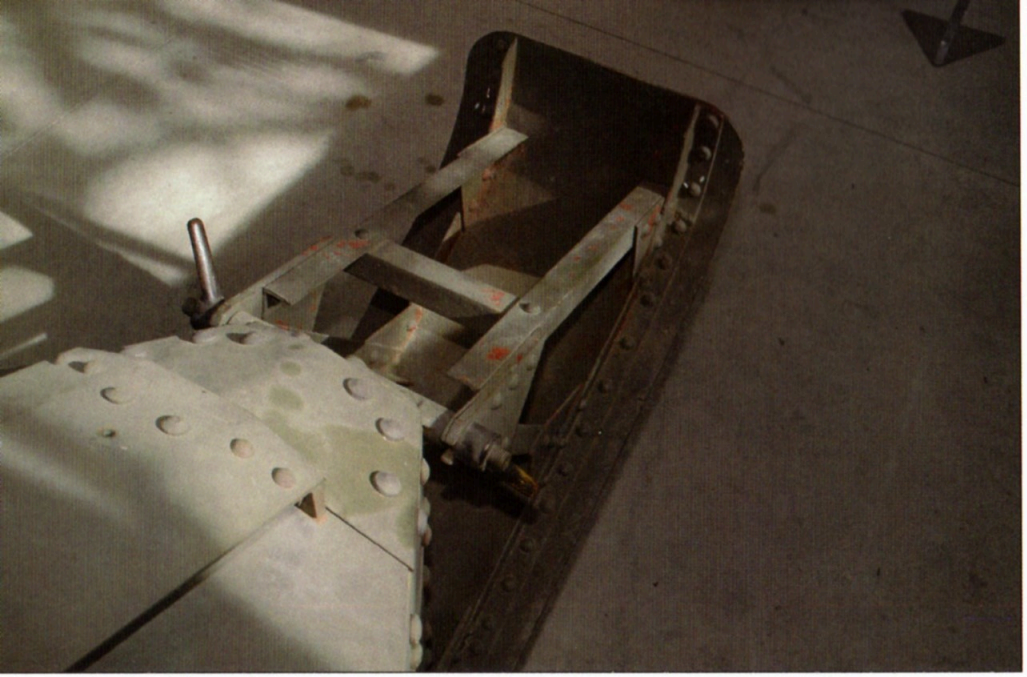
Triangular plates adjoin the sides of the driver's upper door. Whereas the Renault FT-17 had door stops only on the two rear hinges of the lower driver's door, the M1917 had a door stop on all four hinges. (Chris Hughes)

The driver's pedals are, left to right, the clutch, accelerator, and brake. The steering clutch levers have ball ends on the handles. Next to the seat is the transmission shift lever and shift gate, with throttle and spark lever to the rear of the gate. (Chris Hughes)

A photo of the left side of the driver's compartment of the M1917 illustrates the bolt-and-nut construction of the hull, with steel strips and angle irons making up the interior framing. Linkages from the foot pedals run along the floor. (Chris Hughes)

On the rear deck is a raised grille over the radiator air intake: a different design than the FT-17's box-shaped, louvered intake. The armored covers for the fuel filler and the radiator (atop the armored housing for the radiator filler) are both open. (Chris Hughes)

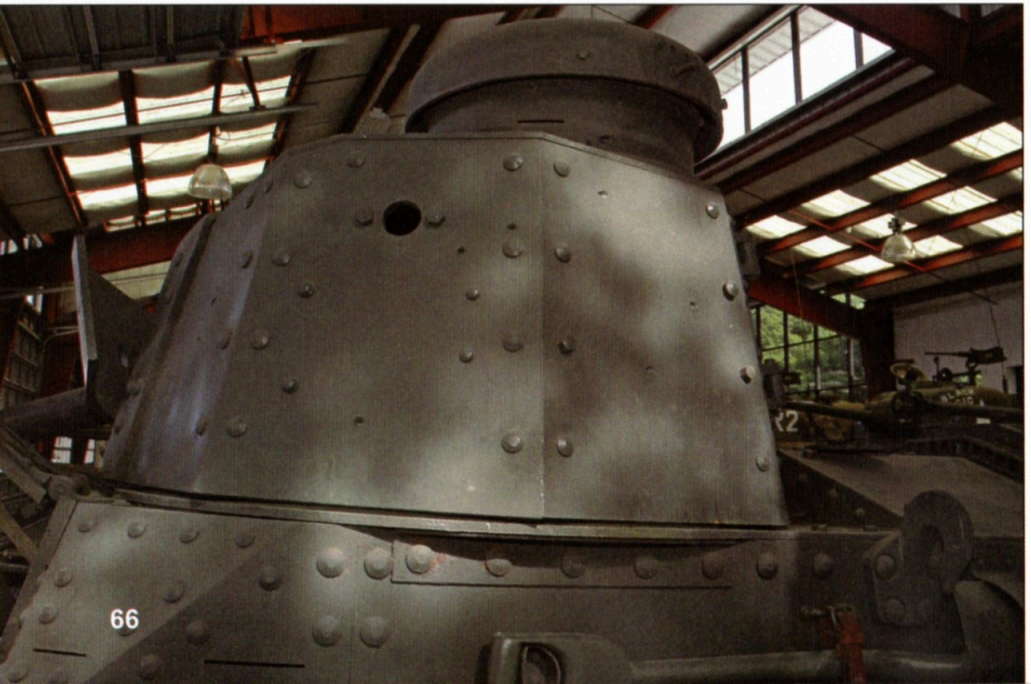




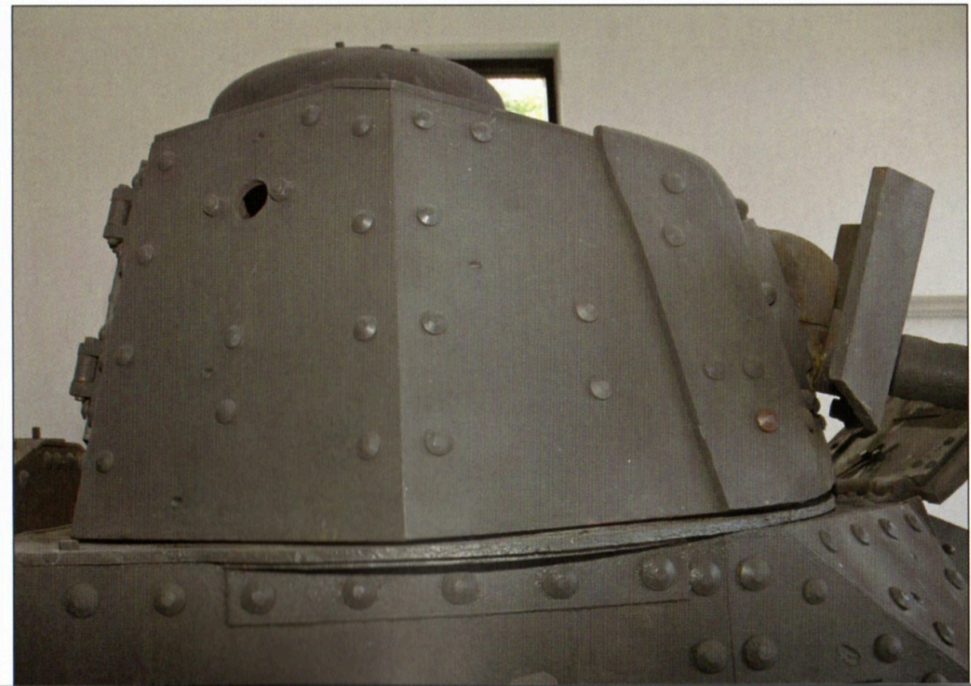
The tail of the M1917 is of all-riveted construction. To lower the tail out of the way in order to start the engine, the two handles at the upper front of the trail were loosened, the tail was pulled up, and then it was lowered. (Chris Hughes)

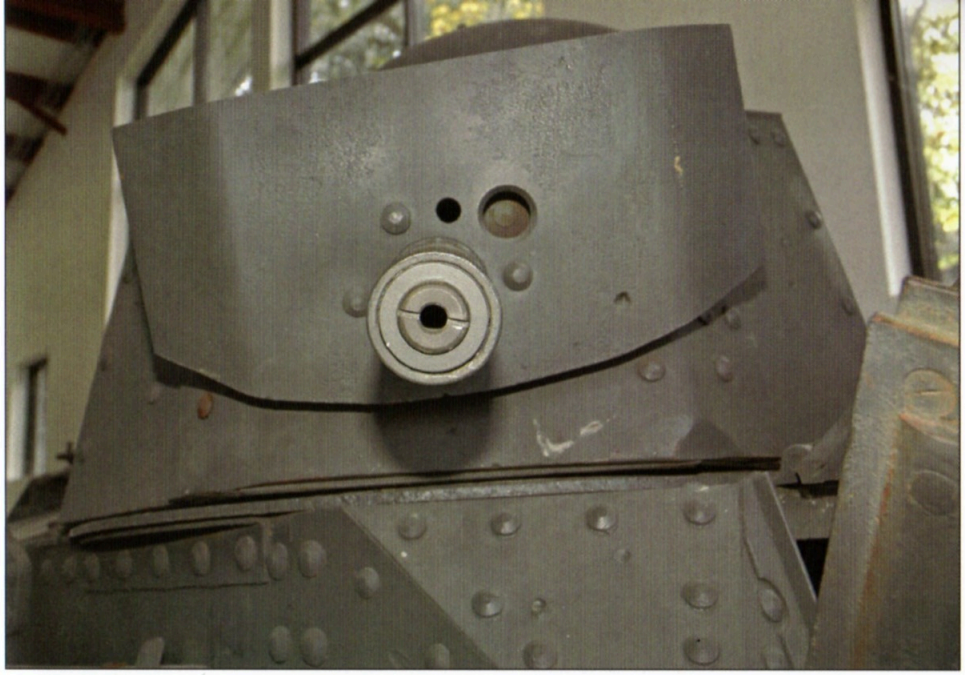
The installation of the Browning M1919 .30-caliber machine gun in the M1917's turret also entailed a new ball mount that overlapped and was bolted to the sides and roof of the turret. There are ventilation holes in the gun's protective jacket. (Chris Hughes)

The left profile of the turret is shown. The cupola is fitted with a cover that can be partially opened, allowing ventilating air to circulate into the cupola. The two vision slits in the plates next to the driver's compartment are visible. (Chris Hughes)



In this right profile of the M1917 turret, to the rear of the turret are the two hinges of the right turret door. The thickness of the gun shield is visible to the right. At the lower left is a lifting hook; these were used for hoisting the vehicle for shipment. (Chris Hughes)



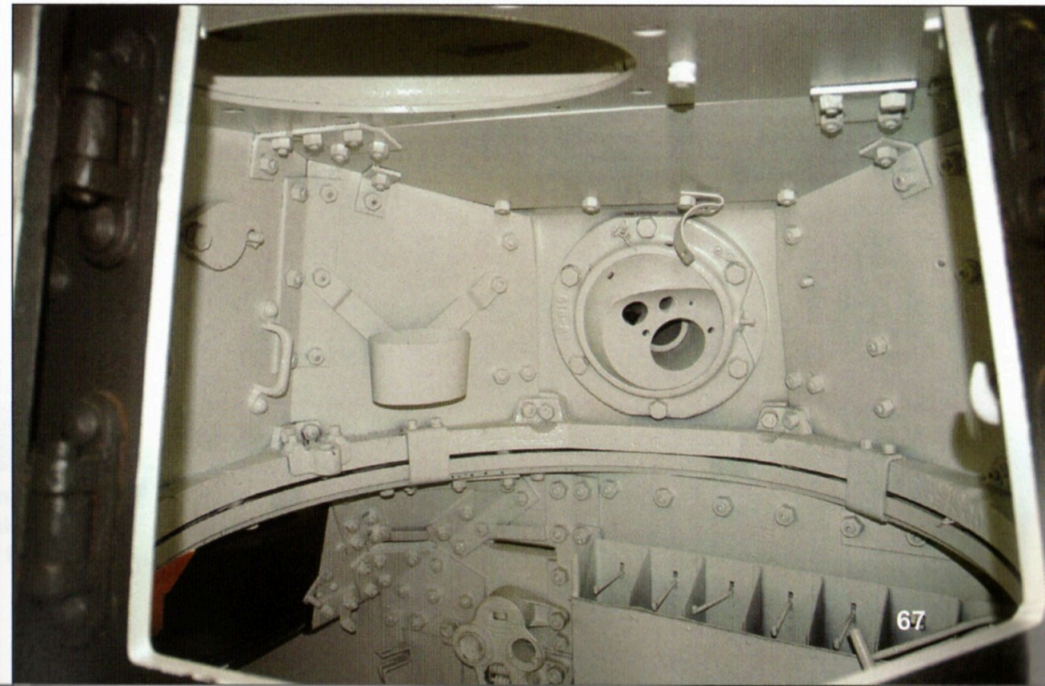


A frontal view of the gun shield of the Browning M1919 machine gun mount shows the part's curved lower edge. The machine gun's protective jacket, with the gun muzzle at its center, protrudes from the shield. Note the sight hole and missing bolt. (Chris Hughes)

This view of the open doors in the rear of the turret of an M1917 also provides a close look at the rear of the cupola and ventilation cover. The integral flange at the bottom of the cupola has one section toward the left where there were no screws. (Chris Hughes)

The ball mount in this M1917 turret holds a Browning M1919 .30-caliber machine gun. Worth noting are the pieces of angle iron that make up the turret's internal frame, and the slotted, flat-headed screws that secure the cupola in place. (Chris Hughes)

The M1917 on display at the Virginia War Museum is lacking its armament, affording an excellent view of the details of the machine gun ball mounting, as well as exposing the various stowage brackets inside both the turret and the tank hull.



This coil spring supports the front of the return roller beam.

The rear of the return roller beam pivots on this sturdy cast steel support.

In this view of the front end of the engine compartment, two drum-shaped steering clutches flank the transmission (center). The bulkhead seen in the top half of the photo is a feature the FT-17 lacked. To the sides are the reduction gear cases. (Don Moriarty)

With the track and the bogie frame removed, a good downward view is provided of the right sprocket of an M1917. To the inside of the sprocket is a case containing a gear and pinion. The 15-tooth sprocket is 25½ inches in diameter. A tow hook is to the left.

This well-preserved M1917 six-ton tank is in the collections of the Ropkey Armor Museum. It has been repainted in a three-color camouflage pattern of olive green, light sand, and reddish brown, and is armed with a late-type M1916 37mm gun in a ball mount with a shield. In addition to several characteristics identifying this tank as an M1917 – the all-steel idlers, redesigned coil-spring housing, left-hand muffler, and revamped hull plates next to the driver's compartment – a jack is stowed on top of the left bogie beam, a feature of production M1917s.

The M1917 has an idler-wheel bearing with a serrated bottom that is fastened with two bolts to a serrated plate atop the bogie beam. To adjust track tension, the bearing bolts are loosened, and the nut on the screw to the rear of the bearing is turned.

The design of the coil spring housing of the M1917 differs from that of the FT-17, in part because of the redesigned track-adjustment mechanism that dispensed with the FT-17's idler yoke. Note the hex nuts that secure the spindles of the return rollers.

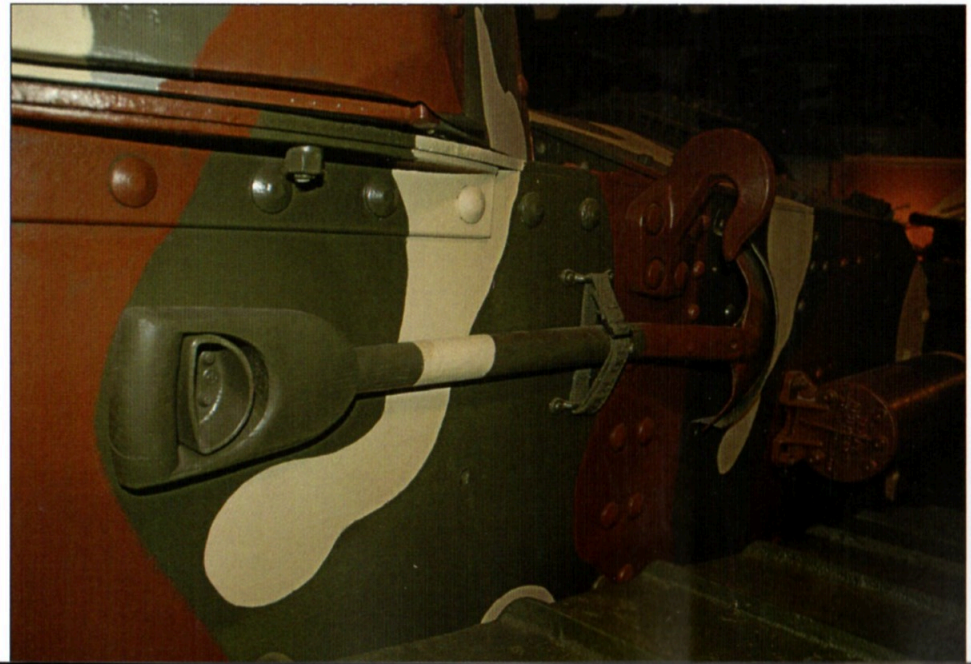
To the rear of the left coil spring housing is a Rees jack. To the rear of the jack is the leaf-spring housing, which incorporates brackets for the rear of the front leaf spring and the front of the rear leaf spring. Both springs are hidden within the bogie beam.

Rees patented jacks, seen here from the side, were made by the Rees Manufacturing Company of Pittsburgh, Pennsylvania. The bottom of the jack is to the right. A cast bracket designed to hold the jack is bolted to the top of the bogie beam.

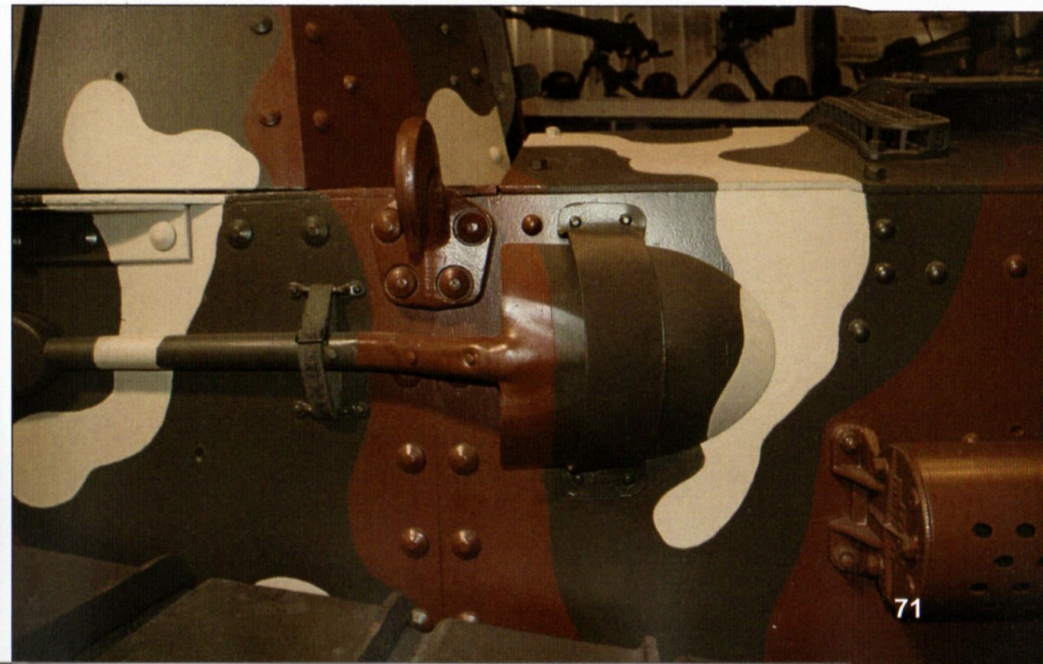
The right lifting hook is above the shovel. To the rear of the shovel is the muffler. On the rear deck, to the front of the radiator filler housing, is the raised grille of the radiator air intake. The tracks lack the "AMSCO" lettering found on many M1917s. (Mike Miserendino, Ropkey Armor Museum)

Chained to a trailer, from this angle, it can be seen that the return rollers of the M1917 have a solid raised rim around the center, as opposed to the two thin raised rims on the Renault FT-17's return rollers. The small plate attached to the cupola cover is a stop, to limit the angle of the cover when open. (Skip Warvel, Ropkey Armor Museum)

A shovel is stowed in brackets, with a webbing strap through footman loops ensuring it stays in place. Fastened to the hull above the shovel's grip is the reinforcing angle iron with its upper edge rounded to match the contour of the hull roof plate.



The left lifting hook (center) straddles a body joint in the hull armor. This hook and its mate on the opposite side of the tank were able to bear the M1917's unloaded weight of 13,400 pounds. The bolt holes in the lifting hook are slightly countersunk.

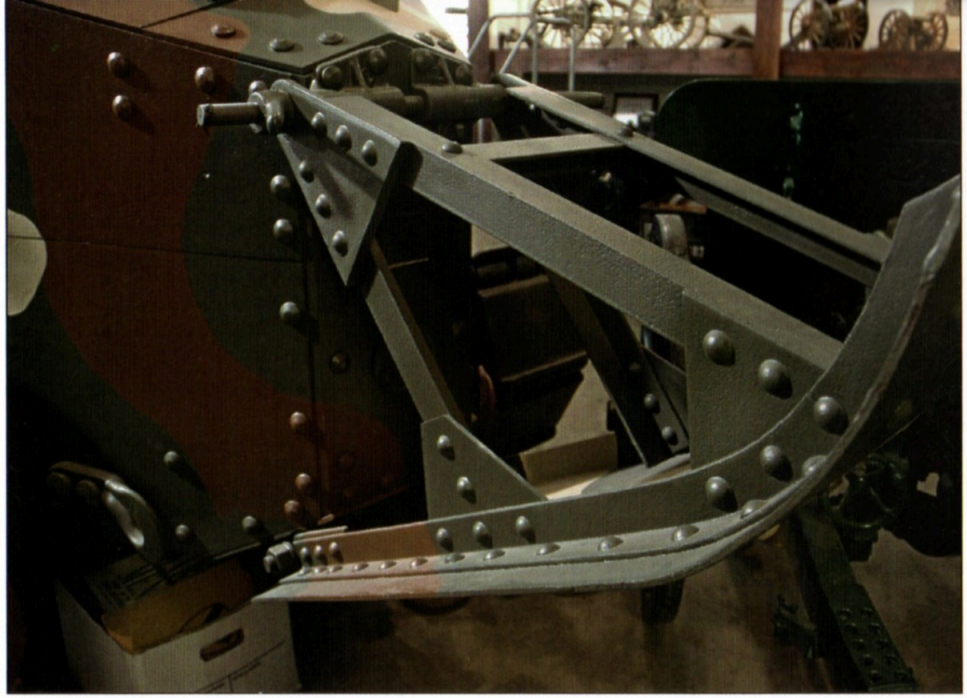


The M1917's support for the rear of the return roller beam forms a single pillar, with its top pinned between the rails of the beam. By contrast, the FT-17's more ornate support forms two arms, with the upper ends attached to the outer sides of the beam.

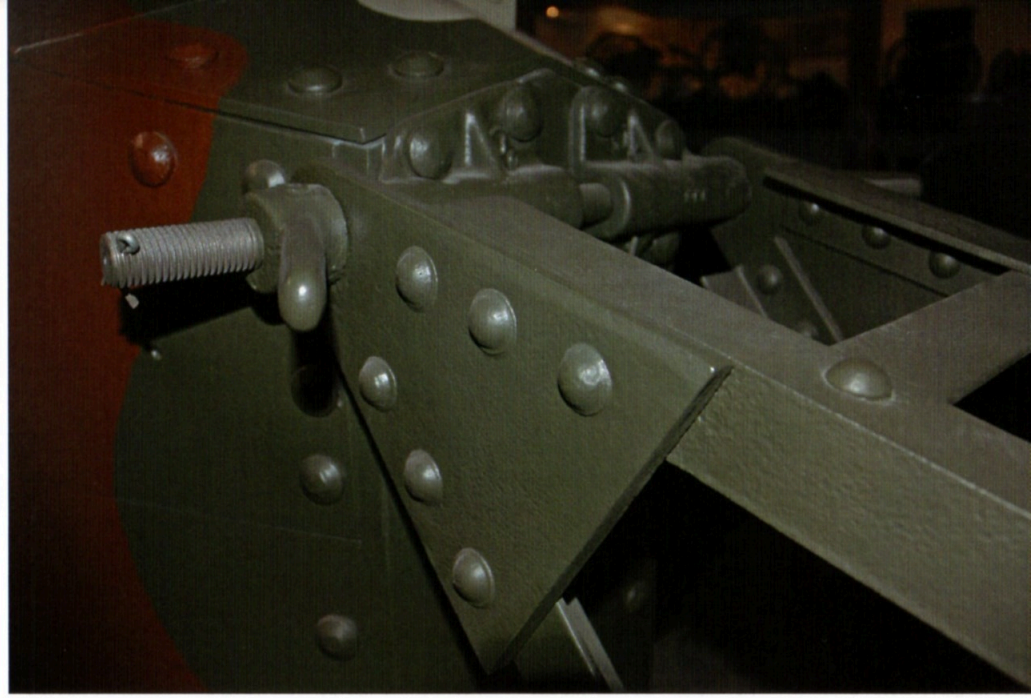
The radiator air intake grille on top of the rear deck is a cast assembly with several flanges for the mounting bolts. Note how it the grille is shaped to fit around the radiator filler housing. Also visible are the channel irons that form the frame of that housing.

The rear deck of the M1917 is viewed from the rear, with the front of the tail assembly at the bottom of the photo. At the center is the center cover of the engine compartment, with a spacer attached to its rear to keep the door slightly raised.

To the left is the rear left side of the M1917's hull. Details of the tail assembly are shown. It can be seen that there is an open jaw on the upper gusset of the tail, and that the handle nut, when tightened, clamps the jaw tight against the bracket on the hull.

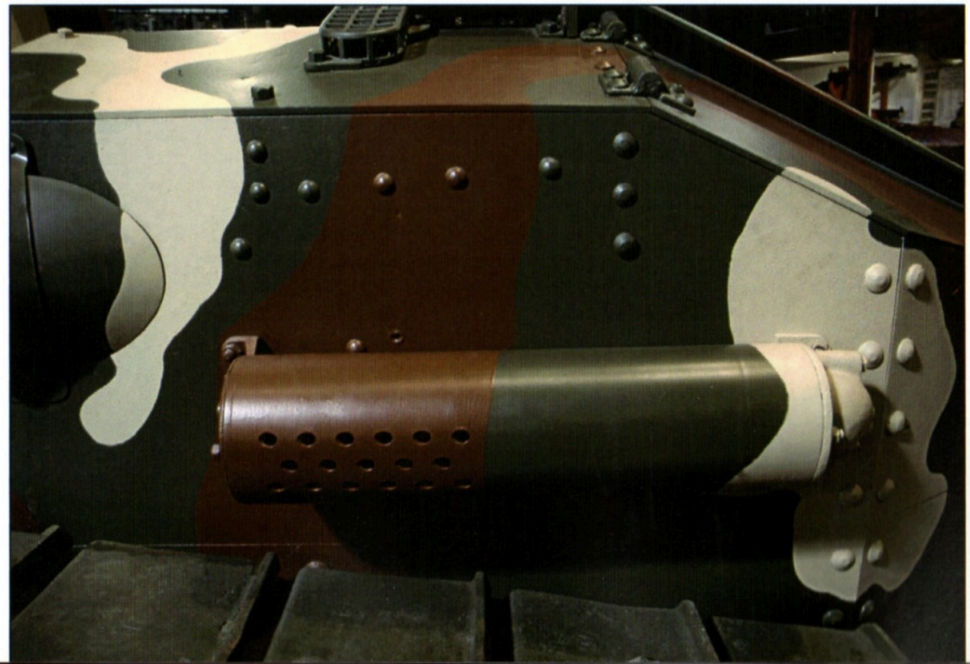


A threaded rod passes through the two brackets on top of the rear plate of the hull. A handle nut is on each side of this rod; the left one is visible in this view. Each side of the bottom of the trail is secured with a hex nut to a threaded pin.

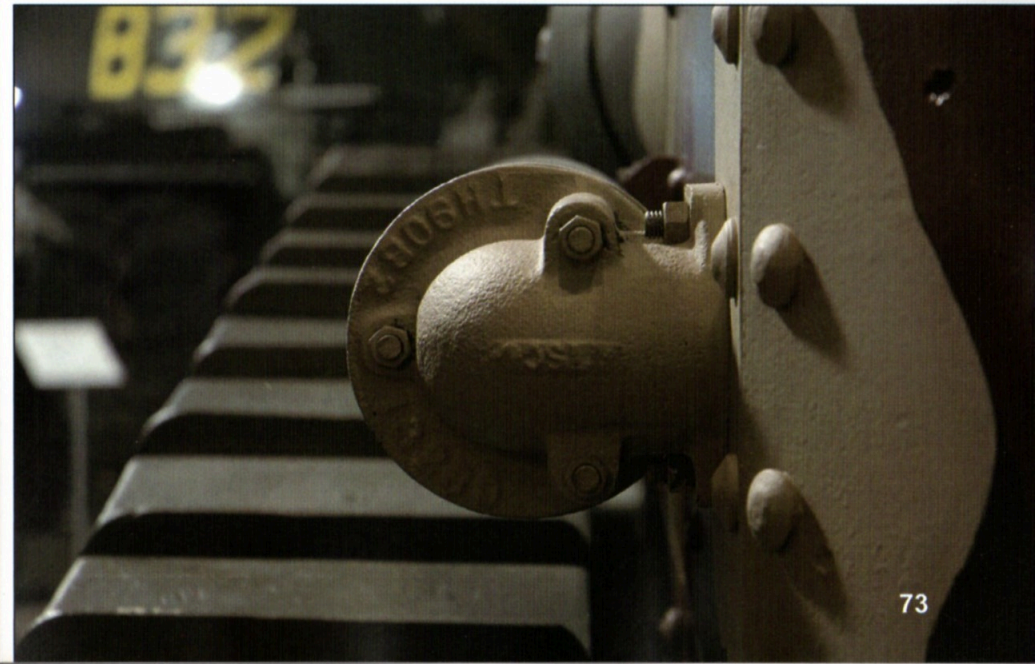


In this close-up of the left handle nut that secures the upper frame of the tail to the rear of the hull, the handle is pointing almost straight back at the viewer. A cotter pin is inserted through the threaded rod to keep the handle nut from being removed.

The M1917's muffler is seen from the side. This assembly was quite different from the that of the Renault FT-17. To the front of the muffler are the outlet holes for exhaust gasses. The thickness of the metal of the muffler cylinder is visible at those holes.

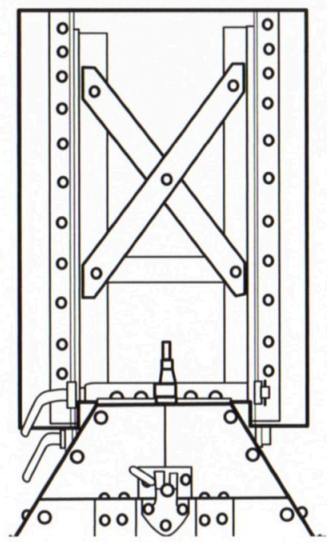


The combination elbow and mounting bracket at the rear of the muffler was referred to as the header. Screws and hex nuts serve to fasten the muffler to the hull, and three hex nuts hold the header to the cylinder of the muffler.

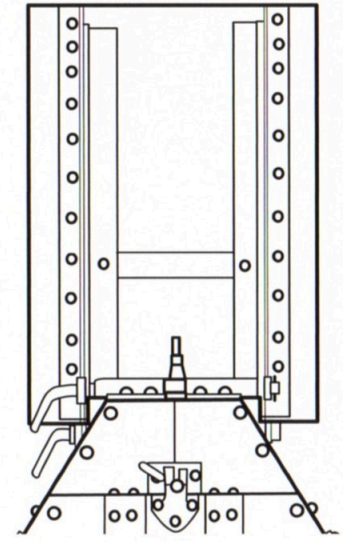


Along the left rear side of the M1917 is its exhaust system, located where a large tool box and associated brackets were found on the FT-17. Most of the rest of the smaller external stowage on the tanks differed as well. (Mike Miserendino, Ropkey Armor Museum)

Tail Skid Design

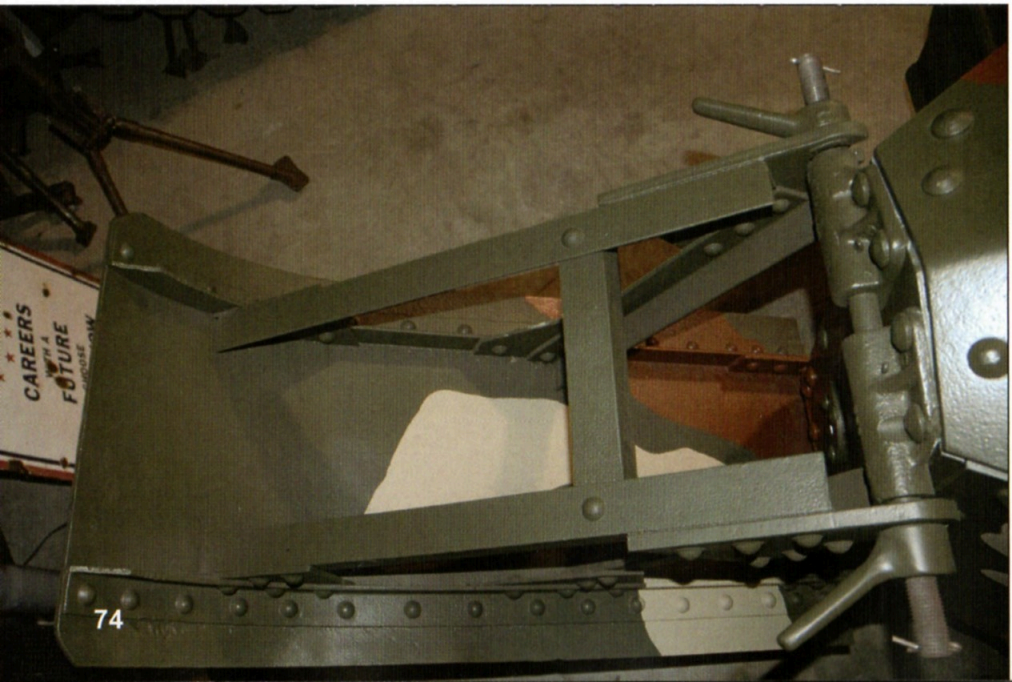


FT-17

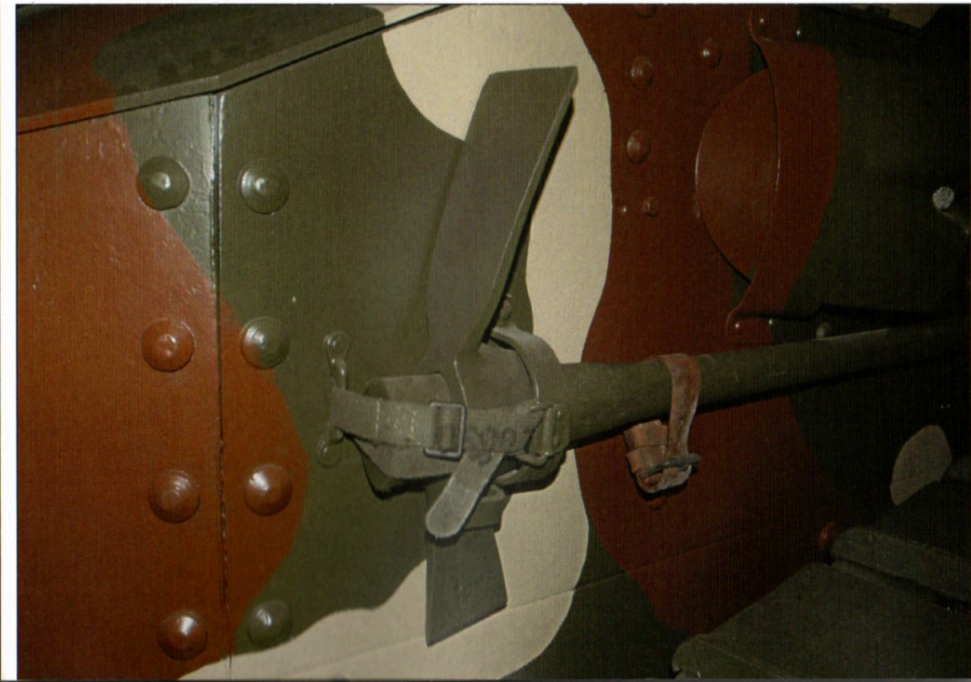


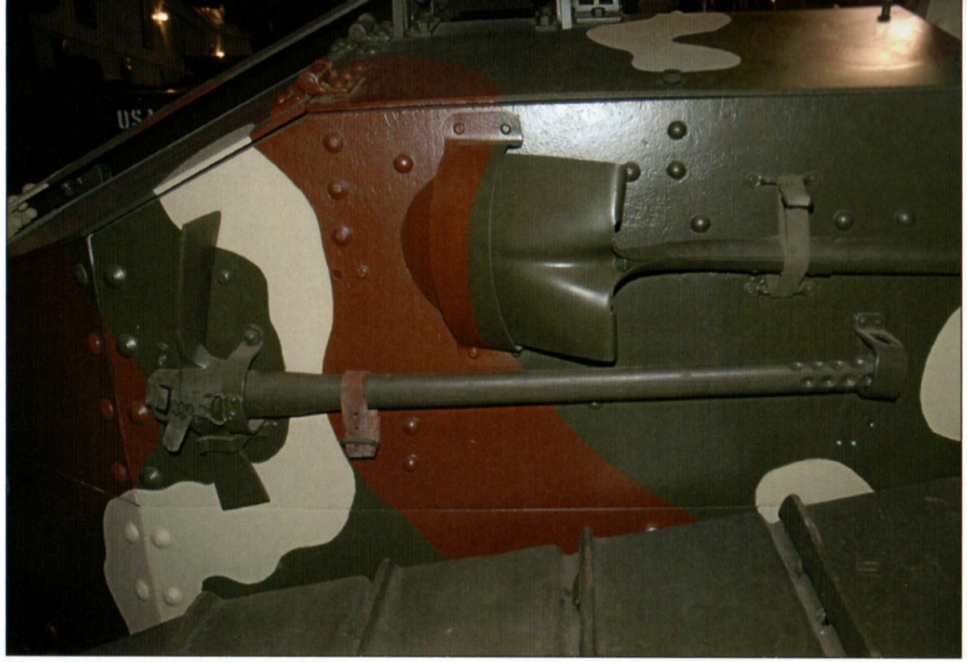
M1917

This photo gives a clear view of the brackets on top of the rear plate of the hull to which the upper front of the tail is fastened. The two handle nuts that are snugged-up to the frame are screwed onto the threaded rod passing through the brackets.



The mattock is stowed in brackets toward the rear of the right side of the hull. An adjustable webbing strap is attached to a ring on the bracket and to a footman loop on the hull, to keep the mattock from working its way loose from its holders.

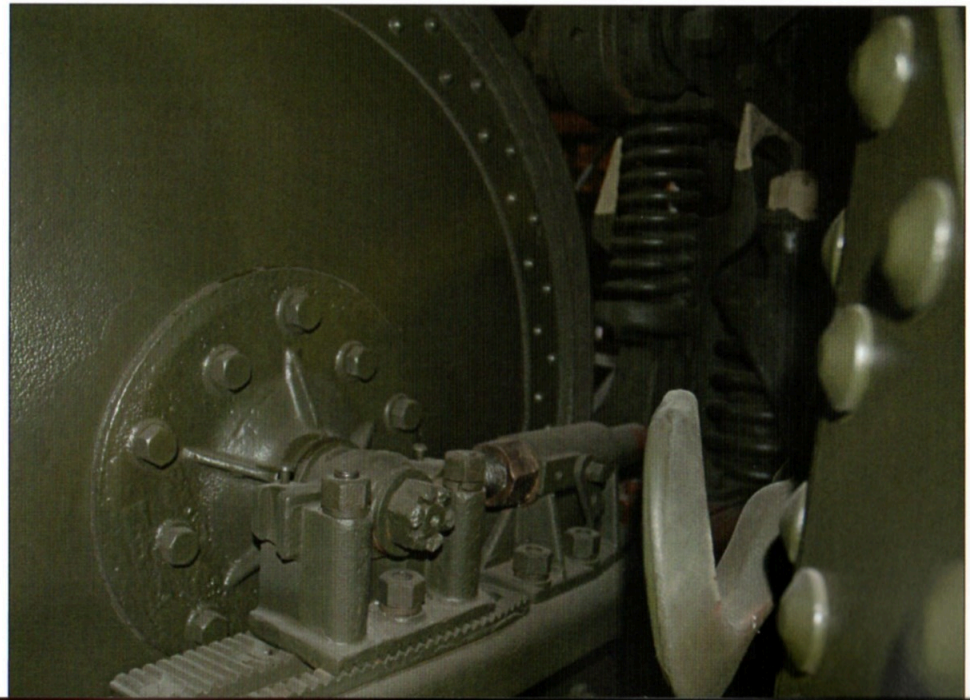




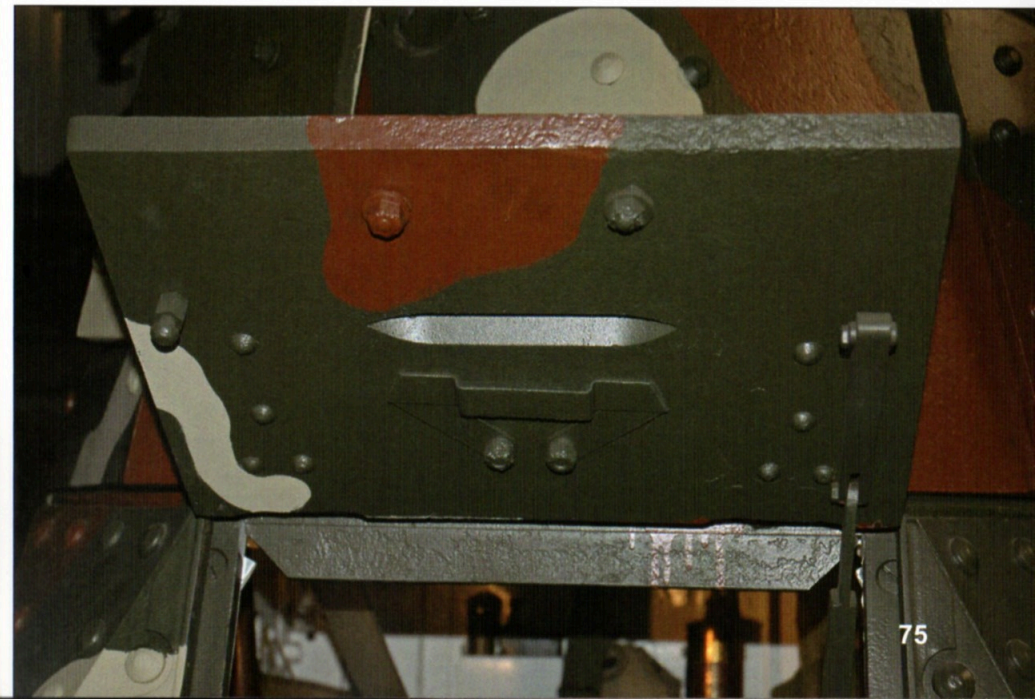
The bottom of the rear mattock bracket has an extension designed to retain the axe side of the mattock head. Stowed on the side of the hull above the mattock is a second shovel. To the upper left is the slightly raised center cover of the engine compartment.

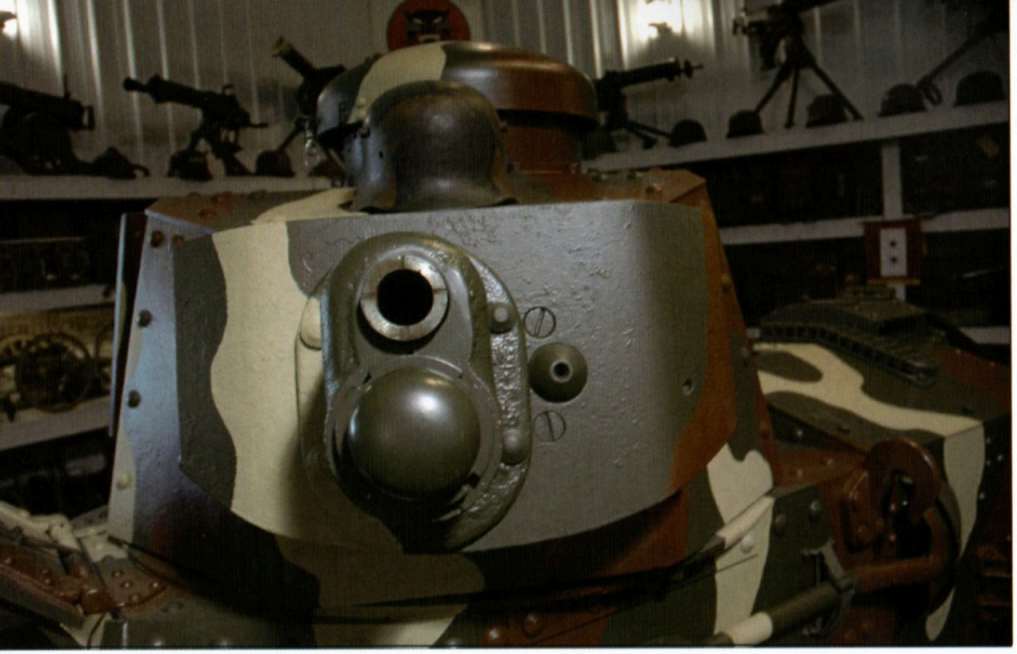
Like the left lifting hook, the right lifting hook is attached to the side of the hull with conical-headed bolts. Below the hook is the straight handle of the shovel. The doors of the turret are open, providing a glimpse of the 37mm ammunition rack.

The right idler's inner bearing and track adjustment mechanism is shown, with the right front tow hook appearing to the right. The bolts that fasten the hull armor to the frame also have slightly flattened conical heads.

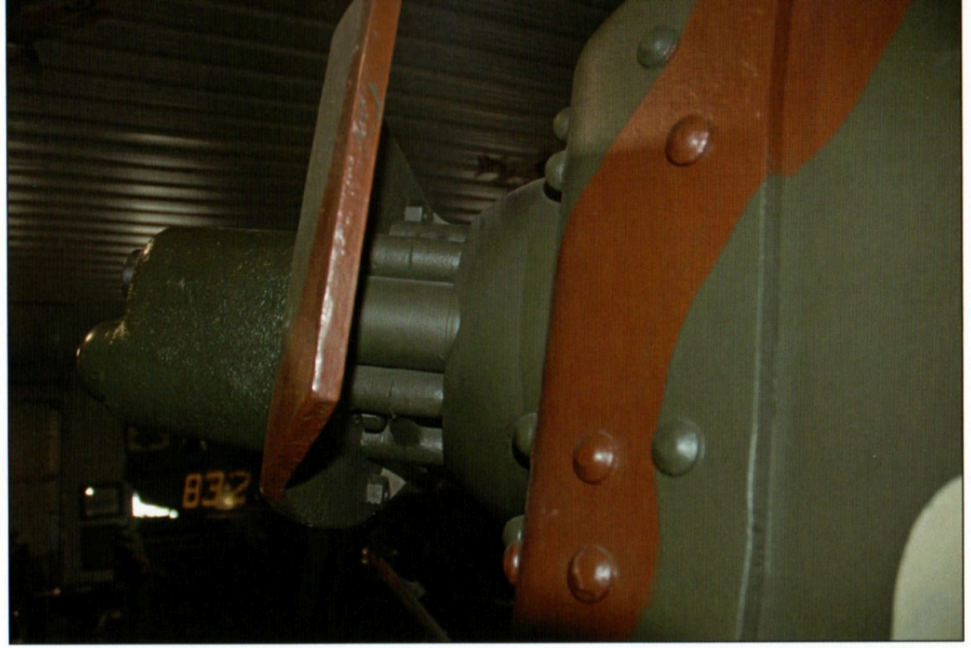


When open, the driver's upper door is held in place by the folding strut to the right. The oblong vision slit is at the center of the door. Above the slit (below in the photo) is a clip for a forehead rest.





The muzzle of the M1916 37mm gun is situated above the gun's recoil cylinder in this head-on shot of the turret. The barrel and recoil cylinder are enclosed in a cast housing, around which an armor shield is fastened. The small conical protrusion on the shield is the opening for the telescopic gun sight. Above the shield is the cupola.



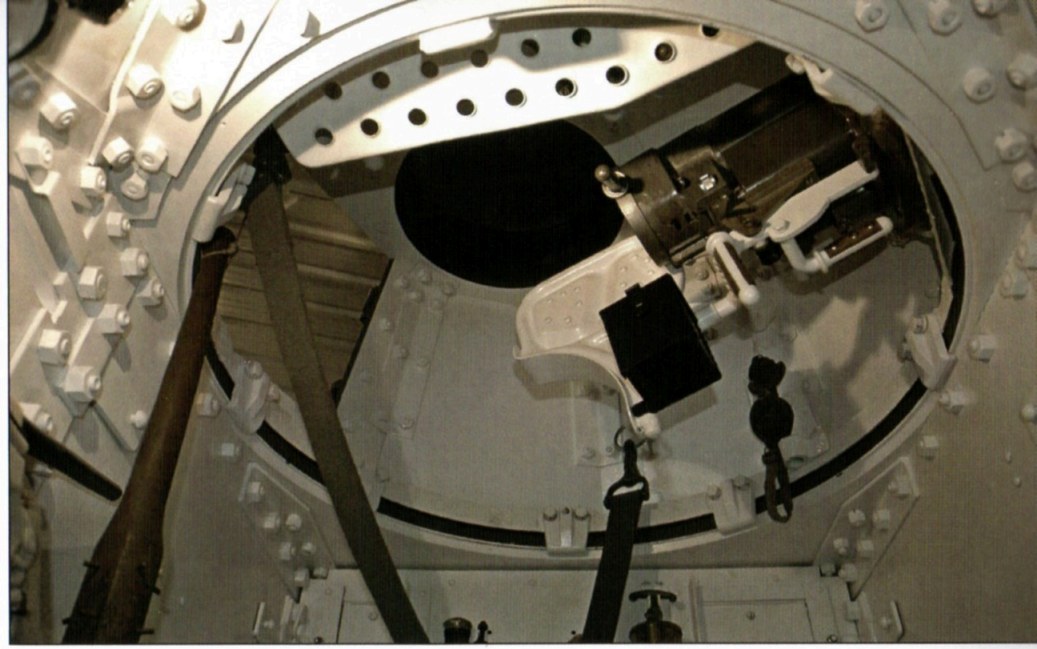
A view of the left side of the 37mm gun shows the relative thickness of the shield. To the rear of the shield are the tube for the telescopic gun sight and the ball mount on the front of the turret. On the rear of the shield, above and below the gun housing, are several of the hex nuts securing the shield to the gun housing.

Viewed from below are the gun shield and bottom of the gun housing flange (top) and the ball mount (center). An indented identification number is stamped on the face of the turret below the ball mount: it appears to read, "1108 B." The turret is traversed to the side, and the reinforcing angle iron with the rounded upper half is at the bottom.

The upper part of the right door of the hull is shown open, with a close-up view of part of a hinge and the pitted hex nuts securing the hinge to the door. Visible inside the white-painted turret are the breech of the M1916 37mm gun, the breech operating handle, and the recoil guard/shoulder yoke of the gun.

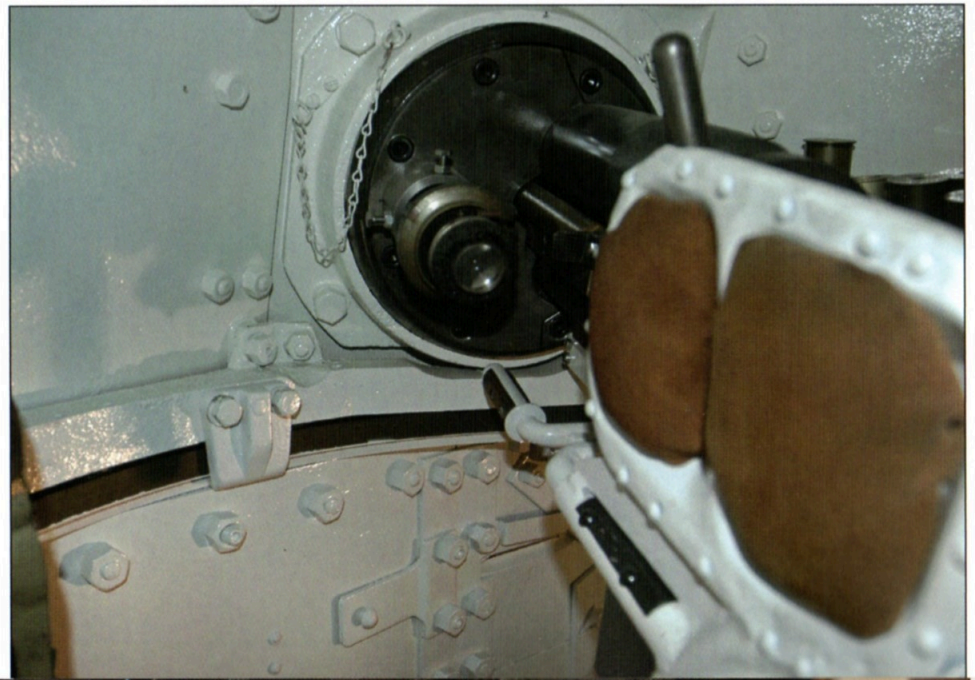
Looking through the doors into the turret, details of the breech-end of the 37mm gun and the interior of the ball mount are visible. The white object to the rear of the breech is the recoil guard with a built-in shoulder yoke. To the right is the ready rack for 37mm ammunition. The M1917 could carry up to 238 rounds of that type of ammunition.

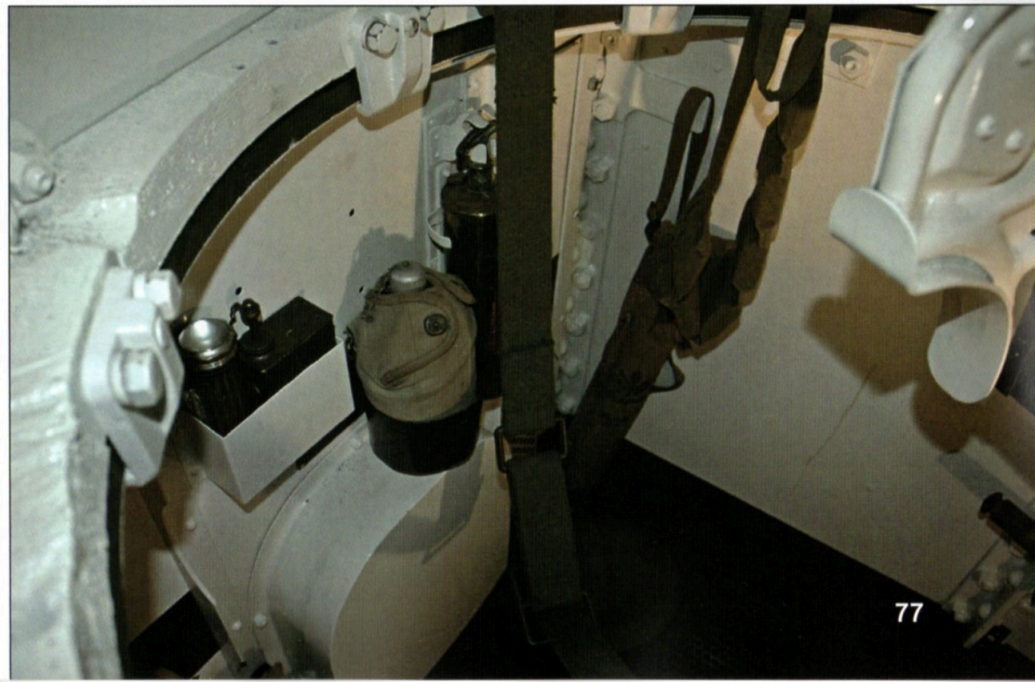
On the left side of the 37mm gun is the M1918 telescopic gun sight. The left wall of the hull is at the bottom of the photo, since the turret is traversed about 90 degrees to the left. The 37mm rounds in the ready rack are visible toward the upper right.

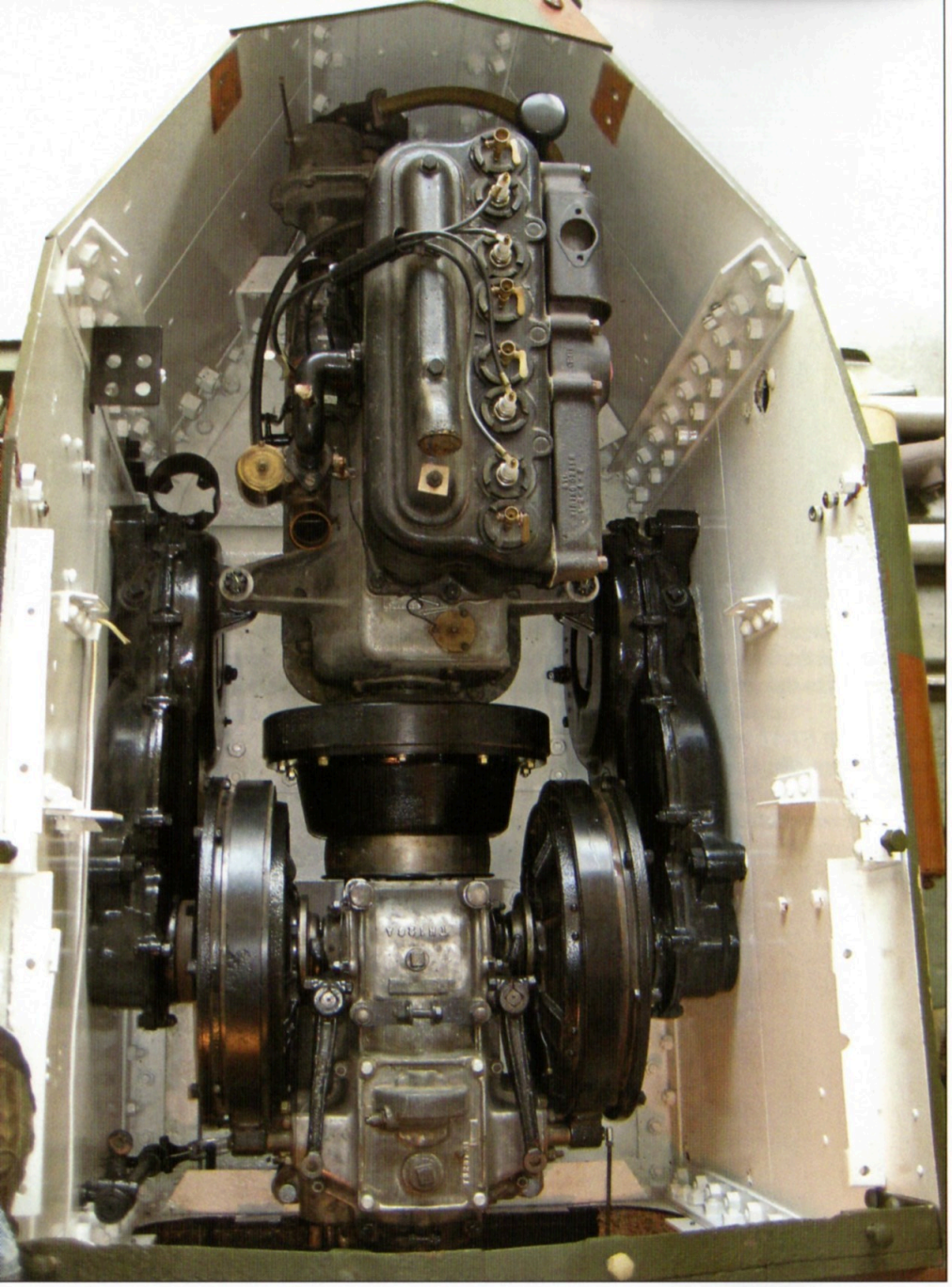


Looking back and up into the turret from the driver's compartment offers a view of the underside of the 37mm gun and the ammunition ready rack. The open door at the rear of the turret is to the left, and the dark circle in the ceiling is the cupola.

The Renault FT-17 lacked a firewall between the fighting compartment and the engine compartment. An improvement of the U.S. M1917 six-ton tank was the addition of a bulkhead, seen to the left in this photo looking down from the turret. Also in view are turret retainers bolted around the turret ring and a canvas signal flag carrier (center).



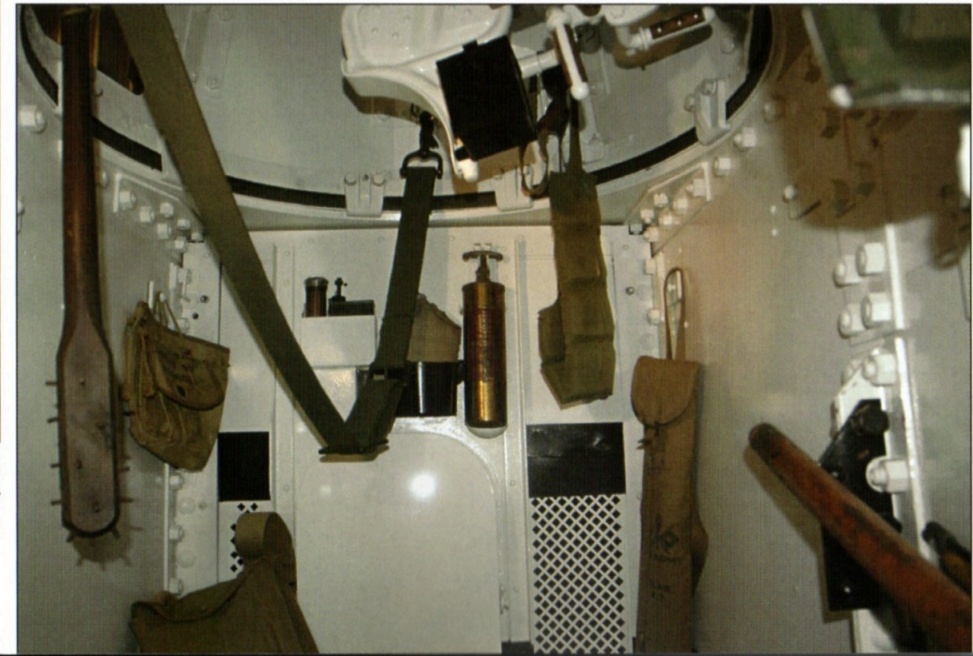




The M1917 was driven by a modified Buda HU 4-cylinder gasoline engine mounted at the rear of the vehicle. It was coupled to a manual transmission (foreground) providing four forward gears and one reverse. Clutch-brakes, actuated by levers, provided steering control. (Mike Miserendino, Ropkey Armor Museum)

With the driver's three doors open, the interior of the M1917 is viewable to the bulkhead at the rear of the fighting compartment. At the bottom center is the driver's seat. Compare the triangular armor plates on each side of the opening for the upper door, with the single, quadrilateral plates used in the same location on the Renault FT-17.

This is the view a seated M1917 driver would have seen if he turned his head to the rear. The bulkhead has asymmetrical diamond-grille ventilating panels on the lower sides. Note the lack of angle-iron framing on either side of the hull adjacent to the turret; this is the reason why angle irons were bolted to the exterior of the hull in those locations.



Details of the latch on the driver's lower right door and of the inside of the upper door with its oblong, beveled vision slit and hold-open strut are visible. The small black device at the center of the photo above the canteen is the instrument panel. The driver had to look hard to his right to read the instruments and gauges on the panel.

Unlike the Renault FT-17 with its canvas cushion and canvas strap for a driver's seat, the M1917 has a low-backed bucket seat. To the driver's left, next to the seat, is a small toolbox, above which on the side of the hull are brackets for holding the staff for the 37mm gun's barrel cleaner. Flanking the seat are the steering clutch levers.

An M1917 instrument panel is shown removed from the vehicle. A speedometer is at the top. The two bottom gauges are odometers, with the top gauge giving readings in kilometers and the lower one in meters. To the left is the oil pressure gauge. On the right is the magneto switch, which was turned from the "OFF" position to the "MAG" setting on the right prior to starting the engine. On top of the magneto switch is the maker's name, Eisemann. To the right are the two mounting lugs for the instrument panel. (Skip Warvel, Ropkey Armor Museum)

Briefly venturing outside as a snow begins to fall, the Ropkey Armor Museum's M1917 recreates a scene from the early days of the United States Tank Corps. The M1917 Six-Ton Special Tractor was the first U.S.-produced modern tank. Like the French FT-17 upon which it was patterned, the M1917 featured a rear engine, forward driver, and a rotating turret housing the main armament – just as U.S. tanks still do nearly a century later. Armament could be machine gun, or, as in this pristine example, an M1916 37mm cannon. (Mike Miserendino, Ropkey Armor Museum)

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